

Cultural Normativity Index: A Profile Similarity Approach

by

Vinita Vader

A dissertation accepted and approved in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

in Psychology

Dissertation Committee:

Gerard Saucier, Chair

Sara J. Weston, Core Member

Jake Searcy, Core Member

Aneesh Aneesh, Institutional Representative

University of Oregon

Winter 2025

© 2025 Vinita Vader

DISSERTATION ABSTRACT

Vinita Vijay Vader

Doctor of Philosophy in Psychology

Title: Cultural Normativity Index: A Profile Similarity Approach

Cultures are marked by a sharedness – similarity in beliefs, values, moral codes, patterns of thinking and feeling – among other things. This sharedness is unequally distributed within the members of culture. But how do we measure this sharedness? Based on the distributive model of culture, and person-environment fit framework, this thesis identified a Cultural Normativity Index (CNI) – the extent to which an individual approximates to their societal aggregate. Employing a multilevel profile similarity approach, CNI is assessed across two broad psychological domains: Mindset (beliefs, values, norms) and Personality (trait tendencies, based on the Big Six) using item pools drawn from a variety of measures covering a broad area of the domains across two studies. Six and eight CNI types based on Mindset and personality domains were assessed in each study respectively. In Study 1 ($N = 2,224$) CNI was strongly associated with GLOBE (*Assertiveness, Future Orientation, Ingroup Collectivism*) and Big Six (*Agreeableness, Resilience, Extraversion, Conscientiousness, Originality*) measures and weakly associated with *subjective well-being*. In Study 2 ($N = 8,588$) strongest associations with CNI were observed with the Big Two (*Dynamism, Social self-regulation*) and Values (*Openness to Change, Self-Transcendence*). Majority of the strongest associations were observed at the country-level. In Study 2, CNI was also found to be associated with place of *family homes* (urban vs. rural), *mother's* and *father's education*, and *age*. Furthermore, differences across CNI-types with respect to the varied associations with measures are discussed.

Keywords: cultural normativity; well-being; mindset; personality

TABLE OF CONTENTS

Chapter	Page
CHAPTER I: INTRODUCTION.....	9
Distributive Model of Culture	11
Content of Culture	14
Person-Environment Fit Framework for Culture.....	19
Person-Environment Fit and Adjacent Frameworks.....	28
CNI and Social Indicators.....	30
Present Research	32
CHAPTER II: METHOD	34
Participants	34
Measures	35
Analyses.....	39
RQ 1: How to generally quantify CNI?.....	39
RQ2: What person characteristics such as age, SES and location type (urban vs. rural) predict CNI? How is CNI related to well-being?	41
RQ3: Does CNI differ across levels of Personality and Mindset traits at the individual and community level?.....	43
RQ 4: Does Mindset-CNI perform better than Personality-CNI?	45
Auxiliary RQ: Can overlap between Personality-CNI variables and predictors such as well-being affect the observed results?	46
Preregistration and Transparency	46
CHAPTER III: STUDY 1	47
Results.....	47
RQ 1: Quantifying CNI	47

RQ2: What person and community characteristics are associated with CNI?	55
Model-Focused View	56
Trait-Focused View	61
RQ 3: Is CNI related to SWB? Can CNI predict SWB?	66
Discussion: Study 1	69
CHAPTER IV: STUDY 2.....	83
Results.....	83
RQ 1: How to quantify CNI?.....	83
RQ2: What person and community characteristics are associated with CNI?	88
Model-Focused View	89
Trait-Focused Approach.....	92
RQ3: What person characteristics such as age, SES and location type (urban vs. rural) predict CNI?	94
Place of Family Home	95
Mother's Education	99
Father's Education.....	100
Age	105
Discussion: Study 2	105
CHAPTER V: GENERAL DISCUSSION	113
Characterization of CNI.....	113
Predictive Capacity of Personality and Mindset Attributes	115
Comments on the Methodology	120
Quadratic and Linear Effects	120
Measuring CNI	124
Limitations and Future Directions	126

Conclusion	128
REFERENCES	130

LIST OF FIGURES

Figure	Page
Figure 1 Response Surface Plot	22
Figure 2 Model Complexity Measures Across CNI Models	51
Figure 3 Correlations Between CNI Types.....	52
Figure 4 Country Means and Confidence Intervals for CNI Estimates: Six CNIs	55
Figure 5 Study 1: Twenty Highest Nonlinear Country-Level Attribute Associations With CNI.....	65
Figure 6 Study 1: Five Strongest Attribute Estimates Across CNI Types.....	66
Figure 7 Model Complexity Measures Across CNI Models	85
Figure 8 Correlations Between CNI Types.....	86
Figure 9 CNI Estimates Across Countries: Eight CNIs.....	90
Figure 10 Study 2: Twenty Highest Nonlinear Country-Level Associations With CNI	98
Figure 11 Study 2: Five Strongest Estimates Across CNI Types	99
Figure 12 Estimated CNI by Family Home	101
Figure 13 Estimated CNI by Mother's Education	102
Figure 14 Estimated CNI by Father's Education	103
Figure 15 Estimated CNI by Age Group	104
Figure 16 Study 1: All Effect Sizes for Big Two Across CNI Types.....	120

LIST OF TABLES

Table	Page
Table 2.1 Study 1: Participant Demographics by Country	34
Table 2.2 Study 2: Participant Demographics by Country	36
Table 2.3 Measures for Study 1	37
Table 2.4 Measures for Study 2	38
Table 3.1 Mindset and Personality Cultural Normativity Index (CNI) Models	53
Table 3.2 Study 1: Strongest Linear Associations With CNI at the Individual-Level	58
Table 3.3 Study 1: Strongest Quadratic Associations With CNI at the Individual-Level	59
Table 3.4 Study 1: Strongest Linear Associations With CNI at the Country-Level	60
Table 3.5 Study 1: Strongest Quadratic Associations With CNI at the Country-Level	61
Table 3.6 Study 1: Highest Effect Sizes Across Mindset and Personality Attributes	64
Table 4.1 Mindset and Personality Cultural Normativity Index (CNI) Models	87
Table 4.2 Study 2: Strongest Linear Associations With CNI at the Individual-Level	93
Table 4.3 Study 2: Strongest Quadratic Associations With CNI at the Individual-Level	94
Table 4.4 Study 2: Strongest Linear Associations With CNI at the Country-Level	95
Table 4.5 Study 2: Strongest Quadratic Associations With CNI at the Country-Level	96
Table 4.6 Highest Effect Sizes Across Mindset and Personality Attributes Across CNI Types	97
Table 5.1 Study 1: Highest Effect Sizes for Big Two Across CNI Types	119

CHAPTER I: INTRODUCTION

The study of cultural differences is a complex endeavor that seeks to capture the essence of shared perceptions of realities within populations. This shared construction of realities (i.e., culture) encompasses a collective understanding of “how things are or should be” and manifest as commonalities at the societal level. This shared cultural framework generates an intricate web of expectations and norms that profoundly shapes behavioral patterns and experiential events in the everyday lives of individuals within a given society. The pervasive nature of this sharedness among other things, engenders a sense of group identity (Haslam et al., 2009) among members of a population. Given the importance of this cultural sharing, there are several critical questions: How can we effectively model and measure cultural sharedness? Which constructs serve as plausible candidates for quantifying sharedness? Is sharedness related to other aspects of psychological functioning? Do individual characteristics, such as age or socioeconomic status, help inform our understanding of cultural sharedness?

To address these questions requires us to examine the conceptualizations of sharedness and culture, comparing constructs for their capacity to identify cultural content, and comparing methods that allow a quantification of sharedness. This will enable us to question some of the assumptions often encountered in research focused on cultural differences. For instance, the idea of ‘cultural membership’ assumes that all individuals in the group are equally representative of the culture to which they belong. And, every member is ascribed the same attitudes and preferences by virtue of belonging to a group that tends to have those attitudes and preferences. Thereby, culture is assumed to be a superstructure that is distributed uniformly across societal members. This view adopts the notion of group as monolithic entities - internally homogeneous and externally demarcated units - often associated with demographic labels. Breaking away from

these homogenizing tendencies the current study integrates insights from cultural theories in anthropology and methodological underpinnings from the person-environment fit literature in psychology, with the aim to acknowledge and take account of the rich diversity existing not merely between but also within cultural groups.

To counter such cultural oversimplifications, we propose a Cultural Normativity Index (CNI), which quantifies individual differences in the degree of alignment with the group's central tendency. The impacts and associations of this alignment may differ depending on the constructs on which alignment is assessed and the individual characteristics associated with it. Furthermore, person level (e.g., *Agreeableness* scores of residents in a country) and community level (e.g., average *Agreeableness* scores of a country) characteristics could indicate important differentiations with respect to the constructs used for measuring the alignment.

One question here that begs to be answered is why do people align with their group's central tendency, culturally? What drives this alignment? Our innate ability to imitate others (Meltzoff, 1988) in our environment serves as the conduit for the transmission and perpetuation of cultural information. This imitation engenders similarity between individuals in a society. However, the capacity to accurately discern, internalize, and manifest cultural similarity varies within a society, reflecting differing degrees of refinement in this tendency among group members during social interactions. This variability is consequential because adhering to cultural norms and maintaining acceptable behavior patterns has advantages for the individual. Such adherence not only fosters cultural similarity but also reduces uncertainty and ambiguity in one's behavior and thinking relying upon modeling by others (Matsumoto, 2007). Conversely, dissimilarity or misalignment with one's culture can lead to affective consequences, such as feelings of guilt and shame, and in some cases, the repercussions could extend beyond emotional

distress. For instance, public display of affection (e.g., holding hands, kissing in public) is generally seen as an acceptable expression of affection in US and many European nations. In contrast, similar behaviors in Saudi Arabia (or other conservative societies), are considered inappropriate and can incur heavy repercussions for violating moral and legal codes of the country.

This understanding of collective norms underscores the critical role of sharedness in cultural survival and evolution. As individuals navigate the complex landscape of social interactions, they must constantly calibrate their behavior to align with cultural expectations while in the meantime they are also themselves contributing to the dynamic process of cultural transmission and transformation, not only by confirming convergent tendencies in the population, but by generating divergent ones through innovation and purely personal expression. Societies tolerate this divergence as it perhaps makes them more dynamic and adaptable over time. Recognizing the importance of this delicate balance—between conformity and innovation, between individual expression and collective harmony—this work seeks to characterize the multifaceted nature of cultural sharedness.

Distributive Model of Culture

A common methodology to study sharedness has been the use of ANOVA or t-test analyses for computing between country differences on variables of interest. For example, mean level differences in power-distance, religiosity or attitudes towards immigrants provide cross-cultural insights with respect to how certain societies come to share a way of thinking that differentiates them from other societies. The effect-size estimates are employed as approximations of culture proximity (or distance) between these societies. A main issue with t-test and ANOVA approaches is that they tend to treat individual differences within a group as

“error” or at best “noise”. This implies that individuals are interchangeable or that each person within a country is an equal representative of the culture of that country. To put it differently, every individual is culturally similar given that they are born and raised in that country. Other theoretical and methodological frameworks have been viewed as alternative measures; for example, an individual-focused (e.g., study of difference in the structure of personality across populations) versus a society-focused approach (e.g., study of relation between variables at national levels) (Minkov et al., 2024), or the more recent geographical mapping of psychological attributes (Rentfrow, 2020) for inferring person- versus society-focused distinctions in culture. However, these alternatives do not account for the variability in sharedness within a population.

Sharedness is integral to the concept of culture, but sharedness with respect to certain cultural contents (e.g., norms, beliefs) does not create total uniformity across the population. Some degree of homogeneity is crucial for ensuring effective communication, coordination, and the overall survival of a group (Matsumoto & Wilson, 2008; Schwartz, 1978; Wallace, 1970), serving as a foundational element for collective understanding and functioning. However, a degree of diversity ensures adaptability, innovation and capacity for change in a given culture and is also what makes room for individuals to exert some control over their lives through evolving patterns of cognition, emotion and behavior within the constraints of a cultural group (Gil-White, 2005; Handwerker, 2002; Schwartz, 1978). It provides potential flexibility in the face of change (e.g., change in environmental demands), therefore enabling adaptive mechanisms like enculturation – the process of refining and extending cognitive capacities through cultural learning (Menary & Gillett, 2022). Enculturation aids in the survival of a culture through socialization of new members of society. Of course, groups as well as group members may vary in their degree of tolerance for diversity.

This emphasis on the varied distribution of culture across group members aligns with the Distributive Model of Culture (DMC; Schwartz, 1978; Wallace, 1970) a theoretical framework seeking to map culture or a more accurate characterization or description of culture. The DMC originated as a response to a tendency that arose within cultural anthropology: the treatment of individual variation in ethnographic research as noise, as with t-tests and ANOVA, due to the researchers' focus on identifying what is most consistent and homogeneous about a culture, which might cause one to miss divergent subcultural trends (e.g., social movements) that arise within the society. The essence of the DMC lies in moving away from the commonly held assumption that every individual in the society is exposed to and curates the same cultural learnings, in terms of both content and magnitude (degree of enculturation), leading to a common set of homogeneously shared ideas. It counters essentialist notions by positing that every individual carries their own version of the culture, which is a result of internalized cultural patterns (i.e. enculturation), arising from interactions between their environments and their own evolving psyche. In that sense elements of cultural knowledge vary in their degree of sharedness. What is shared, and the degree of sharedness could depend on factors such as differences in age cohorts (e.g., millennials, Gen Z), value placed on conformity or traditionalism, or accessibility to major information dissemination channels (e.g., following someone on one's social network).

Saucier (2022) identified ten propositions of DMC: Culture is (1) not equal to a society of group or people and (2) is located in individuals, thus distributed across a population. (3) "Culture-in-person" can be labeled as mindset (including values, beliefs, norms, morality and religion-oriented contents) (4) Culture is distributed non-uniformly, thus has heterogeneity within a society (or population) and (5) is characteristically complex beyond easy comprehension. (6) Individual variability can be extreme, so long as it is organized to afford

some mutual predictability. (7) Some of that variability is associated with subgroups within the society. (8) Shared culture forms a gradation (reflecting degree of sharedness) from very widely shared contents (the most ‘cultural’) to contents with various degrees of partial sharing. (9) A relevant ‘culture-pool’ (aggregate pool of cultural or potentially cultural ideations) includes idiosyncratic as well as shared contents. (10) Culture as distributed across the population is fluid, rather than static, across time.

The essence of culture therefore encompasses commonalities among its members along with the more idiosyncratic expressions within the group. Culture is not a monolithic identity but a “population of meanings” (Rodseth, 1998, p. 55) variably distributed in the mindsets of individuals in a group. While some contents of culture are retained more and thus endure longer than others, some are more distinctive to an individual, locality, or point in time (Sperber & Claidière, 2008) with the widespread and enduring contents seen as the central and the distinctive ones as peripheral (Saucier, 2022). This body of ideations moves and changes over time. Moving from the broad principles of the DMC to the world of empirical social and psychological science that seeks to measure specific variables, we come upon key questions about the content of cultural knowledge: What counts as a cultural ideation, that is, what are culturally relevant meanings or constructs?

Content of Culture

To characterize sharedness we need to ask *what is shared within a culture?* Scholarly discourse on culture reveals a variety of conceptualizations regarding its constituent elements and the core factors that facilitate our comprehension of cross-cultural variations. These supposed key cultural variables range across the domains of norms (e.g., cultural tightness or looseness), beliefs (e.g., patriarchy, religiosity), political orientations (e.g., democratic vs.

republican), historical pasts (e.g., imperial colonies, participating in wars) and even demographic variables (e.g., race, ethnicity). While these variables can effectively map cultural differences, they also present certain challenges.

The large array of meanings accorded to culture has led to methodological challenges (Smelser, 1992): Culture is difficult to treat as a dependent or independent variable when its definition is over-inclusive, leading it to overlap with too many other variables. A panoply of constructs and frameworks further make it difficult to decipher differences and relations between these variables. One solution is to disaggregate (or unpackage) definitions of culture into discrete parts that can then be treated as the basic units of analysis.

A comprehensive dictionary-based topic modeling approach to analyze more than 750 definitions of culture aimed at discerning distinct cultural variables (Vader et al., 2024). Sixteen topics were identified, of which two topics were prominent for their distinctively psychological content: Cognitive/Mindset- (*values, belief, norms, shared*) and Personality-related (*feeling, ways, thinking*). While the cognitive elements emphasize aspects that guide behavior and define goals (e.g., “I believe that all violence should be condemned”) the personality or temperament elements involve one’s characteristic tendencies across situations (presumably guided by or at least affected by the cognitive elements) (e.g., “I worry a lot”). Also noteworthy is that the words ‘belief’ and ‘values’ ranked high in frequency analysis of the definitions of culture, deeming the Cognitive topic as probably more culturally endowed. Although personality has been studied as a culturally differentiating variable across cross-cultural studies, there is a compelling case for cognitive factors as more directly culturally relevant variables. The core of a ‘mindset’—encompassing cognitive schemas, values, and beliefs—serves as a primary guidance system for behavior that affects emotions (via e.g., appraisal processes) as well, thus putting behavior and

emotion in a more peripheral position with respect to culture. Behavior and emotion (thus personality) is what is guided by what is cultural, but is not directly cultural. This helps distinguish humans as cultural creatures from other species, since the other species have behavior/personality patterns in abundance but not so much the shared mindset features of culture (Saucier, 2022). In contrast, personality researchers often highlight behavioral and emotional dimensions as central to an individual's psychological constitution. This operationalization of culture as emphasizing cognitive over personality attributes (while including both) can allow us to access different aspects of culture. Let's take a closer look at these variables.

Some (Fine, 2001; Mc Breen et al., 2011; Morris et al., 2015) have considered norms (rules, standards, expectations) as more central to culture than other aspects. This is because norms are defined as shared socially acceptable boundaries or constraints on behavior (Ember et al., 2015) that contribute to the homogeneity in behavior and practice, essential to consider a collective a culture. However, norms cannot fully encompass the cognitive and motivational aspects of culture (Hill, 2009). Beliefs, on the other hand, can be characterized as cognitive, along with values that serve a more motivational function.

Models of culture that emphasize socially transmitted information have recognized not only norms but also one or both of two other categories: beliefs and values (D'Andrade, 1992; Goodenough, 1981; Tanaka-Matsumi, 2001; Haidt, 2008; Hill, 2009; Markus & Hamedani, 2019; Oyserman & Yan, 2019), as the cultural knowledge domains deemed essential for intergenerational transmission and societal continuity. What differentiates beliefs, values, and norms? Norms are not just describable only as boundaries or behavioral constraints. They are informal injunctions that guide or deter specific behaviors within a group, define the role of one

group in relation to another, are backed by forms of social punishment, are usually institutionalized, and usually function to establish cooperation (Elster, 2007; Hill, 2009; LeVine, 1982). Beliefs, in contrast, are not injunctions; they are best defined as propositions that individuals accept as true (Matsumoto & Hwang, 2021). Social axioms (Leung and Bond, 2004) are an example of beliefs; these are generalized beliefs that pervade a variety of social contexts and interpersonal situations across time periods. Values, in contrast, are not mainly descriptive. A value “is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence”(Rokeach, 1973, p.5). Values are thereby motivational and prescriptive while beliefs are descriptive, and values are abstract and trans-situational while norms are concrete and situation-specific (D’Andrade, 2008). Lonner (2011) suggested that beliefs, values, and norms followed by personality should be prioritized as the fundamental elements for analyzing culture.

Saucier et al., (2015) demonstrated the greater cultural differentiating ability of mindset (i.e. norms, beliefs and values) over personality. They recommended beliefs about religious devotion, regularity norms (conventional ways of doing things in a society), ethnonationalism and hierarchical family values for studying cultural differentiations between populations, because these demonstrate even larger cultural (there, national) differences even than many classic cultural-psychology variables. Personality constructs – consistency in ways of thinking, feeling and behaving - were among the least differentiating, ranking second to last out of 18 types of constructs employed, suggesting that personality may be less significant in distinguishing cultures compared to mindset. These findings bring forth some interesting insights.

One may argue that a society where a vast majority of the population is impulsive (personality) may lead to undesirable outcomes. There is a need to have some proportionate contribution of self-control among individuals that can maintain balance in this society. There may be however, no such need for balance when it comes to mindset-contents. Another difference refers to the schematic nature of mindset variables. They are likely to invoke ideals that people uphold or believe in, when typically engaged in situations that impinge upon an individual's fundamental beliefs or their sense of right vs. wrong or acceptable vs. unacceptable. In that sense there is a dynamic toward convergence in cultural schemas, ideals – especially when it comes to worldview, values, and moral and social norms – because groups relatively united with regard to these could have some advantages. These advantages may include, working toward a common goal/ideal, or agreement on many fundamental assumptions about the world, which further means less argument and conflict. It seems preposterous to argue such with regard to personality, and moreover personality and temperaments naturally diverge within a population and people have a hard time eliminating that divergence. It is perhaps easier to eliminate divergence in thought (cultural contents) than inborn temperament, perhaps. This may help account for why less personality differences are observed across cultures, i.e., cultural mindset is more malleable than personality. People could be socialized to all be religious or individualist or such more readily than they could all be socialized to be extraverted or ambitious.

The extent to which group members align by the ideological truisms prescribed by their culture, could influence their rigidity in abiding by those truisms such that it leads to selective favoritism for the adherents and hostility towards nonadherents (Zmigrod, 2022). The knowledge of what is considered to be true can not only steer choices cogent with their deeply held ideologies but may also affect the ability to identify cultural demarcations across societies. The

underlying principles (or mindset) that shape behavior may offer more direct insights into cultural distinctions than observing the resulting behaviors themselves, as is common in personality assessments.

So far, we have drawn from the DMC that culture is unevenly distributed in the population with an internalized representation within every individual that can be prone to change over time (whether toward greater cultural convergence as in enculturation, or toward individual nonconformity with mainstream cultural trends). Mindsets (values, beliefs, norms) and personality are two contenders as culturally differentiating variables with both argument and evidence indicating that the former likely has greater differentiating strength. Quantifying the cultural sharedness is however an important consideration in order to understand how individuals in a society experience culture.

Person-Environment Fit Framework for Culture

The concept of group membership is deeply embedded in how many people think about culture. A group of people is an important prerequisite for a culture to exist. The fit between an individual variant of culture (person) and the overall culture (environment) has been demonstrated to have important psychological consequences for members of a cultural group (for e.g., Götz et al., 2018). Person-Environment (PE) fit studies focus on the dynamic interplay between individual and environmental attributes typically operationalized in terms of personality, values, or goals. The PE-framework originally applied to study worker-organization relations (e.g., Judge & Ferris, 1992), has also been adapted to study compatibility between student and university (e.g., Roberts & Robins, 2004), person-community relations (e.g., Bleidorn et al., 2016; Lanning et al., 2024) and cultural phenomena such as immigrant-host culture fit (e.g., Weston, 2024).

The field of organizational psychology, which pioneered and extensively developed PE-fit research, posits two primary categories of fit: *complementary* (distinct or contrasting characteristics of P and E whose interaction enables goal attainment) and *supplementary* (similar or congruent characteristics of P and E whose alignment enables goal attainment). When it comes to individuals living in a society, supplementary fit seems particularly salient. Sharing of similar beliefs and ideologies (e.g., *capitalism is destroying our lives*) is more likely to promote sharedness, whereas differing beliefs (e.g., *some members of this society favor while others oppose capitalism*) are likely to cause division or disagreement. However, one could also argue for a balanced disagreement to foster successful outcomes (e.g., *capitalism when allowed to operate but under strong regulations, such as progressive taxes, can coexist with high aggregate happiness*). We focus on the supplementary fit framework in the current study.

Explanations for PE-fit mechanisms include identifying and *attracting* a suitable environment engaging in efforts for *changing* or *creating* an environment to reflect congruence with one's attributes and accommodate or *conform* to environmental demands (Kandler & Rauthmann, 2022). Of course, the implementation of these mechanisms is contingent upon the degree of autonomy afforded by the environment and the individual's capacity to exercise agency within the constraints of the context. For instance, it is possible that the norms for adult behavior that characterize the specific culture, support specific normative behaviors that inhibit an individual's deviance from fit with their environment (Kandler et al., 2024). Discordance with one's environment could lead to detrimental effects for mental health (e.g., Hopwood et al., 2022) and physical health (Kandler & Rauthmann, 2022). These findings resonate with those based on DMC discussed earlier.

The methodological approaches employed in calculating fit indices and evaluating their associations with various outcomes have profoundly influenced our interpretation and understanding of findings within the domain of PE-fit research. Environmental attributes conceptualized via (1) individual perceptions of the context (*subjective fit*) or (2) through aggregated self-perceptions of all individuals within the context (*objective fit*). The attributes are often based on values, goals or personality measures. To test the fundamental tenet of PE-fit – behavior is a function of both person and environment ($B = f(P, E)$; Lewin, 1936), *Difference Scores* (DS) - calculated as the simple algebraic, absolute or squared difference between person (P) and environment (E) variables – were used initially. Serious limitations of this method were identified. DS confounds the effects of PE-fit on the outcome by collapsing P and E into a single predictor, thereby obscuring their unique contributions. DS inherently assume that the impact of misfit is the same regardless of whether P exceeds E or E exceeds P by the same amount. Real-world relationships between P and E are often non-linear and asymmetric; the consequences of overfit and underfit may differ in magnitude and direction. Furthermore, DS suffer from low reliability. The reliability of a difference score is generally lower than that of the individual P and E measures; the errors in measuring P and E accumulate in the difference score. This low reliability can lead to attenuation of the observed relationships and a reduction in statistical power. For over two decades, *Polynomial Regression Analysis* (PRA) has dominated PE-fit research, with *Response Surface Analysis* (RSA) providing a visual examination of the relationships modeled in PRA.

PRA addressed several critiques characterizing DS. PRA disentangled the effects of P and E by specifying them as separate main effects, allowed for quadratic relations between PE-fit and outcomes, avoided low reliability issues of building an index based on two measures that

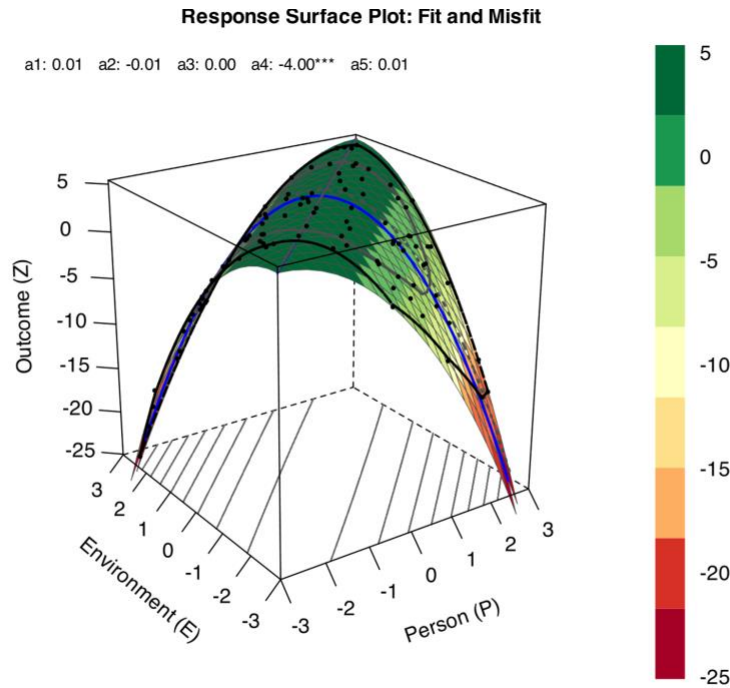
include error and moreover enhanced interpretability by identifying relations of outcomes at varying levels of fit and misfit. The following equation exemplifies this approach:

$$Z = b_0 + b_1 P + b_2 E + b_3 P^2 + b_4 PE + b_5 E^2$$

Here the outcome Z (e.g., well-being) is regressed on P - Person level characteristics (e.g., personality traits)- and E - Environment level characteristics (e.g., average personality traits of the community). The regression equation typically includes linear terms (P and E), quadratic terms (P^2 and E^2), and the interaction term ($P \times E$), allowing for the modeling of non-linear and asymmetric relationships between P and E .

Figure 1

Response Surface Plot



Note: Plot simulated using RSA package (Schönbrodt & Humberg, 2013) in R.

The predicted values of Z (z – axis) are plotted over the range of P (x – axis) and E (y – axis) values to create a response surface with a fit ($P = E$) and a misfit ($P = -E$) line.

The visualization helps interpret the nature of the PE-fit, such as whether the outcome is maximized when P and E are aligned. The curvature and slope with respect to the line of congruence ($P = E$), reveal detailed insights into the fit dynamics. Fit is observed when four conditions are met (Vianen, 2018): 1. the surface is curved either downward (concave, reverse U-shape) or upward (convex, U-shape) along the misfit line (blue line in Figure 1) indicating that when P and E attributes are mismatched, the outcome Z should either decrease (negative relationship) or increase (positive relationship), 2. the first principal axis (line crossing the blue line in Figure 1) is the line along which the surface shows the most pronounced upward curvature; this should ideally be parallel to the fit line, indicating that the highest outcomes occur when P and E attributes match, 3. the fit line should be characterized by a flat slope-indicating a consistent optimal outcome when fit is achieved - while the misfit line by a curved slope - representing varying levels of outcomes as misfit increases; the blue misfit line (Figure 1) has a downward slope showing a decline in outcome as misfit increases. 4. The endpoints of the misfit line (where P and E are maximally divergent) should exhibit either the lowest or highest outcome, depending on the direction of the fit–outcome relationship. Figure 1 supports a negative fit–outcome relationship, wherein the endpoints show the lowest outcome levels.

While this method demonstrates notable efficacy in examining the dynamic nature of PE-fit across outcome levels, it presented several notable limitations (Vianen, 2018). The inclusion of multiple terms in the regression equation necessitates relatively large sample sizes to maintain statistical power and precision. When examining multiple fit dimensions, the consequent increase in the number of significance tests may inflate the probability of Type I errors. The conceptual interrelatedness of the predictor terms in the regression equation could lead to multicollinearity, potentially compromising the stability and interpretability of the estimated

coefficients. The outcome-dependent nature of PE-fit indices further compromises their stability, as fit computed using identical measures may yield varying inferences based on the outcome specified (Rauthmann, 2021).

Furthermore, the implementation of PRA, particularly in cross-cultural assessments of outcomes, has often overlooked potential violations of measurement invariance (Weston et al., 2024)—a psychometric property that ensures the constructs being measured have the same meaning and structure across different groups or cultures. It assumes that the structure of measures used for assessing predictors and outcomes are consistent across groups, compromising the validity of findings. In fact, the personality measures commonly used in PE-fit research are often based on the Big Five which has been poorly replicated across cultures¹. PRA can accommodate continuous predictors and, according to more recent advances, binary outcomes (Barranti et al., 2017). However, it fails to accommodate for categorical predictors (Weston et al., 2024) (e.g., age cohort, rural vs. urban place of residence). Moreover, the fit estimates are compromised with regard to reliability as the models employed do not account for the nested data structure (e.g., people nested within states, states nested within countries); total variance should account for variance around individual-level PE-fit estimates as well as that for the group-level estimates.

Profile Similarity Analysis (PSA) efficiently addresses these issues by using measures that are commensurable while not presuming measurement invariance (Weston et al., 2024) and by allowing for computing PE-fit as an individual difference, free of dependence on the outcome. PE-fit estimates are typically based on the correlation between *P*- and *E*-profiles, viewed as a statistically robust approximation of congruence (Rauthmann, 2021). Studies in the domains of

¹ Poor replication would be failure from the standpoint of being the attribute-structure that emerges readily from a wide variety of languages and not suffering from decrements in reliability when moved across cultural boundaries.

behavior genetics (e.g., Kandler et al., 2021), vocations (e.g., Etzel et al., 2019) and interpersonal relationships (Brauer et al., 2022) have frequently employed PSA. It has also been a popular choice for person-community fit between participants' profiles and the average profiles of their community/culture (Holland, 1997; Schultz, 2016). There are, however, some drawbacks for using correlations (to estimate fit) such as their sensitivity to outliers. If an individual profile has one item response that is egregiously different from the cultural mean profile, it is likely to penalize the fit estimate, despite item responses being otherwise similar to the mean profile. More importantly, correlations are sensitive to missing data (Weston et al., 2024) – our ability to compare measures of correlation-based-fit across persons is limited to the extent that they completed different items; fit estimates can indicate greater variation, and thus imprecision, for participants who provide fewer responses. The multilevel (MLM) framework mitigates these limitations by regularizing (or adjusting) fit estimates towards the sample mean, which is particularly beneficial when dealing with fewer responses (Weston et al., 2024). Participants with fewer responses would have their estimates adjusted (or regularized) toward the overall average, producing more precise and stable estimates. MLM also allows for computation of distinctive fit after controlling for overall normativeness (Wood & Furr, 2016) and can support procedures like ipsatization that combat effects of response styles (Fischer, 2004), especially relevant to psychological measures. There have been several variations in the way PE-fit has been embedded within the MLM framework. Three main approaches are discussed below.

Fit as deviation (FaD) approach, follows the profile similarity framework, and involves computing PE-fit based on mean deviation from the community (elevation), deviation from the community mean variance (scatter) or correlation (or standardized deviation) with the community profile (shape). Time-variant measures (e.g., age, education) are regressed on

repeatedly measured outcomes (e.g., satisfaction) in Level 1, followed by time-invariant fit indices in Level 2; persons are further nested in regions at Level 3 (Götz et al., 2018). Next, the Fit as slope in RSA (FaSR) approach applies a combination of MLM and RSA to study similarity within dyads. The initial step involved computing within person associations (WPA's or random slopes) to assess the congruence between two measures across time (e.g., to what extent is daily frequency of social interactions related to well-being across time); here item-based profiles at Level 1 are nested within persons at Level 2 in a random-intercept random-slope MLM. After this, the fit across WPA's in the dyad's (e.g., male and female) are added as regressors in an RSA model predicting interpersonal outcomes (e.g., relationship satisfaction). Another variation involved using residuals in the specified latent decompositions of the measures (e.g., sociality) as operationalization of fit (Humberg et al., 2024). Although specific to study of fit within relationships, this approach signifies the use of random-slopes as proxies for fit/congruence. The Fit as slope in MLM (FaSM) approach involves nesting P profiles, regressed on E profiles in Level 1, within persons at Level 2 (Weston et al., 2024) that can be further nested within geographical regions in Level 3. FaSR implicates specifying complex models that are less capable of handling missing data (Humberg et al., 2024), beyond the RSA limitations outlined above. It is also likely to underestimate fit estimates given the variability predicted for higher number of parameters; besides it does not make considerations for response styles. FaD and FaSM approaches are more in line with the advantages of MLM framework outlined earlier. FaSM is ideal for person-community fit estimation as it can also allow for studying the associations of PE-fit with continuous $[P(a \leq x_i \leq b) = \int_a^b f(x_i) dx_i]$ and categorical $[P(x_j \in A) = s \in A \sum p(s)]$ variables in both directions of causality (fit $\rightarrow x_i, x_j$; $x_i, x_j \rightarrow$ fit) by adding these to Level 2 predictors of slope or by regressing them on fit slopes. It can also aid in handling

varying nomological constitutions of fit wherein fit can be conceptualized and assessed across different constructs of psychological domains (e.g., morality, social axioms, extremist thinking, personality). When the research questions center around the construction and characterization of fit and its relation to other psychological constructs (both at the individual and community level), FaSM is the more appropriate choice. Therefore, adopting the FaSM approach allows for a versatile and comprehensive analysis of PE-fit, particularly when investigating complex constructs.

The relevance of FaSM to the study of CNI largely stems from its two key characteristics: (1) adaptive ability for computing and comparing fit/CNI based on varying diverse domains of cultural constructs, and (2) compatibility with different operationalizations of environment; cultural constructs can be distinguished from conceptions of environment. For (1) although most studies so far have employed personality and values variables to operationalize fit with culture specifically in psychology, this framework can also be used with other mindset domains that use scales with varying number of items. In case of (2), researchers have conceptualized environment in multiple ways - community level aggregates of observer-ratings where both P and E come from different samples (Fulmer et al., 2010), participant evaluation of their environmental attributes (Gilbreath et al., 2011; Roberts & Robins, 2004), and community level aggregates of self-ratings where both P and E belong to the same sample (Vianen, 2018). The choice for operationalization of P and E rests on the theory underpinning the conceptualization of fit. This approach effectively lends itself to the study of culture given that it allows for identifying a way to operationalize the overall way of thinking (E) and the variation from it (P). Objective fit (e.g. mean attributes of a society) and subjective fit (e.g., evaluation of others' attributes in a society) offer interesting approaches to the conceptualization of culture.

The latter could be influenced by phenomena including but not limited to *selective exposure* (seeking information congruent to one's beliefs), *selective avoidance* (avoiding information incongruent to one's beliefs), *confirmation bias* (favor information that confirms one's beliefs), *biased assimilation* (interpreting ambiguity in a way that drives assimilation with pre-existing beliefs), *bias blind spot* (failure to acknowledge that one's thinking could be influenced by non-rational choices) or *pluralistic ignorance* (exaggerate the difference between self vs others' attitudes and beliefs). The former, wherein environments can be differentiated by varying mean levels in traits of people within them (Holland, 1997), therefore lends itself to a less biased way of capturing the variation in how people think in a society.

Person-Environment Fit and Adjacent Frameworks

Profile similarity within the PE-fit framework shares significant parallels with methodologies in other disciplines. For instance, the cultural consensus model (CCM; Romney et al., 1986) which is a useful auxiliary to the DMC - wherein culture is viewed as a population of varying fragments of cultural information or "idioverses" (Rodseth, 1998) similar to the variation captured by PE-fit involving the deviation of P around E. It offers a scalable way, to quantify how well individuals in a cultural group represent the consensus. CCM focuses on patterns of agreement within a cultural population and identifies relative positions of group members with reference to their similarity with the group centrality or the cultural consensus. Within the person-centered CCM framework, a cultural mean profile is computed by averaging all participant values for every item in each population. The individual profiles are correlated with the cultural mean profile of the population to which they belong, yielding a value associated with cultural consensus for every individual.

Going back to 1920s Strong Vocational Interest Blank (SVIB; Strong, 1927) drew on the idea that of assessing fit with an occupation by comparing an individual's set of responses to the aggregate responses of persons in that occupation. If we consider professions (e.g., engineer, lawyer, professor) as subcultures, a high occupational fit will be marked by a high resemblance between an individual's response to a variety of items with those of the aggregate (culture-associated) responses of a big sample of members of that profession. These statistical approaches mirror the use of PSA in the PE-fit literature. This cross-disciplinary convergence underscores the utility of profile-correlation methods in understanding person-group dynamics across diverse fields.

However, there are also some issues within the theoretical framework underlying these methods, especially in case of CCM. The correlation in CCM is seen as the cultural 'competence' – cultural knowledge possessed by each individual. While there has been some support for thinking about culture as knowledge in psychology (Ojalehto & Medin, 2015) this positioning may not readily apply to all cultural variables. One issue with this approach is the use of the word 'competence' that implies culture-emphasized skills such as knowing the vocabulary of the local language or the social and moral norms. Extent of cultural typicality as displayed when one (dis)agrees with statement such as "I believe in the supernatural", "Elders deserve respect" or "I am always on time", does not necessitate any particular form of ability or adeptness. The worldviews – or the ways in which a culture describes the natural/social world – as measured by these statements, mainly consist of a set of ideas that have been internalized by an individual that impinge on their responses to different situations.² The term 'cultural

² One could argue that knowledge of the consensual social desirability values of personality attributes-as one component of 'social desirability responding' would be knowing how to be socially desirable- is cultural competence. Afterall, in order to fake successfully, one would need to know what to fake. However, the process of parsing out the cultural knowledge component (e.g., differentiating it from the tendency to respond in a socially

normativity' (CN) is more appropriate to refer to the degree to which a particular individual converges with the central tendency of the population they come from. CN can include both cultural competence (regarding norms and consensual values) and typicality (regarding how the world is viewed, or regarding personality tendencies), in fact these can be considered differentiable subtypes of cultural normativity.

CNI and Social Indicators

The person-culture match theory (Fulmer et al., 2010) posits that individuals are inclined to align with the prevailing norms of their culture, motivated by the psychological (e.g., well-being) and social advantages (e.g., sense of belonging) they gain from such conformity, within their cultural context. Recent studies have increasingly validated the predictive capacity of PE-fit, here Personality-CNI, for well-being outcomes (Götz et al., 2018; Jokela et al., 2015; Joshanloo, 2023; Lanning et al., 2024; Rentfrow, 2020; Weston et al., 2024). Cultural (e.g., independent vs interdependent self-construal, individualism vs. collectivism) fit has been found to confer healthy lifestyle benefits (Levine et al., 2016) while a cultural mismatch may confer detrimental effects on academic performance (Stephens et al., 2012). CCM research has found lower psychological distress corresponding to high consonance within cultural domains such as lifestyle, social support, family life, national identity, and food (Dressler et al., 2007) and higher *immunostimulation* (immune-system response and inflammation in the body) linked with low consonance with the cultural norms for seeking social support (Dressler et al., 2016).

Another precursor to CNI is socioeconomic status (SES), which demarcates differences in access to material resources and relative rank in social status, and has been theorized to influence an individual's propensity to conform to cultural norms and sanctions (Ishii & Eisen,

desirable manner or from the greater plausibility of certain items to elicit socially desirable responses) from social desirability is complex (Johnson et al., 2011).

2020). Moreover, given the educative role of parents in imparting social norms (Brouwer et al., 2023) it is possible that high parental SES may be linked to a stronger alignment with one's cultural norms (Ishii & Eisen, 2020). To the extent parental SES is confounded with – or measured by – parental education, (since education is a form of additional intense enculturation, cultural socialization) higher CNI values will be expected. The observed typicality with one's culture can also be affected by whether one grows up in a city or in the countryside. Evidence comes from the study of *normative life scripts* – a society's shared anticipation of the normative progression and chronology of pivotal events throughout a typical lifespan (Berntsen & Rubin, 2004). More pronounced normative life scripts are characteristic of rural areas reflecting traditional thinking, while urban regions exhibit a greater diversity of lifestyle choices, resulting in less typical life course trajectories (Hatiboğlu & Habermas, 2016).

Variables such as parental education (ParEd; e.g., Grossmann & Varnum, 2011; Hamamura et al., 2013; Stephens et al., 2012), maternal education (MEd; e.g., Na et al., 2016) and paternal education (PEd; e.g., Weinberg et al., 2019) are often utilized as indicators of SES. Education can be seen as a type of socialization, and socialization is in good part enculturation (Bruner, 1996) – a process through which individuals learn and adopt the characteristics of their culture. Therefore education-as-enculturation is not merely operating at school but indirectly (also via the parents' past education) at home (e.g., Lareau, 2011). In other words, one could argue that parental education could serve an additional role in enculturation, beyond that provided by the educational setting of the child. Higher PEd could inculcate values or norms or descriptive worldview, broader range of ideas and values, potentially affecting conformity with social expectations. In cultures where educational attainment aligns closely with cultural expectations, PEd might reinforce adherence to these norms. Values associated with cultural fit

such as conformity orientations are also likely to be transmitted across generations (Rauscher et al., 2020).

Present Research

The DMC proposes that culture is distributed non-uniformly across individuals, and the CCM proposes that certain individuals are more representative of the sharedness and more particularly prone to endorse the cultural norms, beliefs, and values reflective of the wider community's consensus. These frameworks collectively suggest that (a) no single person will perfectly represent the overall culture, and (b) individuals will vary in the degree to which they match the shared culture of the society. In accordance with these models, the current study hypothesizes that individual response profiles to indicants of beliefs, norms and values will be distributed non-uniformly. That is, a few individuals will have response profiles highly representative of the mean responding in the population they come from, and at the other extreme responding of some individuals will show only a modest relation to typical responding in that population. In line with the evidence derived from CCM (Dressler, 2018; Maltseva, 2014) and the previously discussed PE-fit literature, we hypothesize that alignment with the cultural prototype, represented by Mindset-CNI and Personality-CNI, will have differing associations at varying levels of well-being and SES. Mindset-CNI is also likely to show meaningful relations with individual personality characteristics across cultures.

To test these hypotheses the profile-similarity approach using MLM (Weston et al., 2024) will be employed. This approach (1) allows for the use of categorical variables unlike the more popular variable-centered Response Surface Analysis (RSA) methodology (2) does not require the assumption of measurement invariance (3) allows for estimation (and partialing) of normativeness (4) is not sensitive to confounds due to response style differences. While extant

research in PE-fit has extensively examined variations in fit contingent upon diverse outcomes, a significant lacuna persists in our understanding of the differentiation in fit effects across operationalization of fit based on different psychological domains, specifically in the context of objective PE-fit. This research fills this gap in the PE-fit literature offering an insight into how cultural alignment, when operationalized differently, could potentially offer instances of associations with various psychological and social phenomena.

CHAPTER II: METHOD

Participants

Two samples will be used for the current research. For Study 1, data from a project focused primarily on studying extremist mindsets (Saucier et al., 2009) will be used. Participants were sampled from 8 countries ($n = 2,224$), distributed across five world regions (Table 2.1). Among these five regions the largest numbers of participants were sampled from Confucian Asia and the least from Latin America. Regions including Africa, Middle East, southeast and south Asia are not represented in this sample. Surveys were administered by a mixture of online and paper-and-pencil questionnaires across countries. Participants were generally enrolled in the first year of college in their respective countries and shared similar socio-economic status and other demographic characteristics. This helps minimize confounds between country, socioeconomic status and education (although it does limit the ultimate generalizability of results).

Table 2.1

Study 1: Participant Demographics by Country

Country	Mean Age	% Male	<i>n</i>
<i>Confucian Asia</i>			
China	17.93	36.49	707
Korea	21.80	58.08	396
<i>Anglo</i>			
USA	19.62	31.69	385
<i>Southeast Asia</i>			
Malaysia	20.99	33.47	265
<i>Eastern Europe</i>			
Slovakia	21.74	47.56	251
Serbia	21.73	25.97	231
<i>Latin America</i>			
Guatemala	22.90	12.69	197
Chile	20.31	30.81	186

Study 2 comprised of a subsample of participants from an online Survey of World Views (Saucier et al., 2015) project that studied dozens of culturally-relevant variables. Participants were from 27 countries ($n = 8,588$)³ that add up to 2/3 of the world population in both number and economic impact. The countries included in the sample represented nine world regions, well beyond the five regions sampled in Study-1 data, with sample sizes exceeding 100 across all 27 countries (Table 2.2). Participants were recruited to the online-administered study from various postsecondary institutions (ranging from vocational and community colleges to universities) with many of the countries having more than one recruitment location.

Measures

Tables 2.3 and 2.4 summarize measures used for assessing CNI's and identifying its associations with personality and mindset attributes as well as demographic variables, across studies. Some items were rescaled (specifically for subjective well-being in Study 1) to ensure standardization of response categories across items.

³ While the original data (Saucier et al., 2015) consisted of a larger sample ($n = 8883$), countries with ($n > 100$) were retained for the current study which led to the exclusion of data from six countries from the original sample. This ensured greater precision and power in detecting random effects in the multilevel framework used in this study.

Table 2.2

Study 2: Participant Demographics by Country

Country	Mean Age	% Male	<i>n</i>
<i>North Africa/Middle East</i>			
Morocco	25.62	49.87	441
Turkey	21.12	45.7	416
<i>East Asia</i>			
Japan	20.86	36.77	429
Taiwan	22.56	35.53	395
China (Mainland)	20.79	27.02	350
<i>Southeast Asia</i>			
Philippines	19.99	32.29	425
Thailand	21.61	28.31	350
Malaysia	20.51	34.24	324
Singapore	21.66	44.98	304
<i>North America/Australia</i>			
USA	21.94	42.86	425
Canada	21.76	38.64	220
<i>South Asia</i>			
India	21.07	37.58	390
Bangladesh	21.72	78.08	272
Nepal	21.02	40.82	346
<i>Africa (sub-Saharan)</i>			
Ethiopia	24.03	70.71	381
Kenya	24.60	66.67	288
Tanzania	24.82	67.51	256
<i>Western Europe</i>			
Spain	22.73	36.28	379
Germany	23.61	48.37	349
UK	22.74	38.05	229
<i>Latin America</i>			
Peru	21.83	39.32	309
Argentina	24.29	44.02	243
Brazil	22.19	21.05	195
Mexico	26.57	34.92	157
<i>East/Southeast Europe</i>			
Greece	21.78	29.81	246
Ukraine	20.21	36.49	244
Poland	21.17	11.83	225

Table 2.3

Measures for Study 1

CNI type	Variables	Citation	Items
Mindset-based CNI variables	<i>Isms Dimensions</i> (Tradition-oriented Religiousness, Subjective Spirituality, Unmitigated Self-Interest, and Communal Rationalism)	Saucier (2000)	24
	<i>GLOBE normative societal practices</i> (performance orientation, future orientation, humane orientation, gender egalitarianism, assertiveness, collectivism, power distance, and uncertainty avoidance)	House et al. (2011)	33
	<i>Social Axioms</i> (social cynicism: a negative view of human nature and social events)	derived from Leung & Bond (2004)	4
	<i>Extremist thinking patterns</i>	Stankov et al. (2010)	14
	<i>Values</i> (Items from 10 values-clusters proposed by Schwartz; Tradition, Self-direction, Achievement, Conformity, Universalism, Hedonism, Security, Benevolence, Stimulation, Power)	Lindeman & Verkasalo (2005)	10
Personality-based CNI variables	<i>Big Six model</i> (Conscientiousness, Extraversion, Agreeableness, Originality, Honesty/Propriety, Resiliency)	36QB6 measure; Thalmayer et al. (2011)	25
Predictor Variable	<i>Age</i>	demographics	1
	<i>Subjective Well-being (Life Satisfaction)</i>	Satisfaction with Life Scale; Pavot & Diener (1993)	5

Table 2.4

Measures for Study 2

CNI type	Variables	Citation	Items
Mindset-based CNI variables	<i>GLOBE normative practices</i> (performance orientation, future orientation, humane orientation, gender egalitarianism, assertiveness, collectivism, power distance, and uncertainty avoidance).*	House et al. (2011)	43
	<i>Cultural tightness-looseness</i> (some items used a referent-shift format)*	Gelfand et al. (2011)	6
	<i>Social axioms</i> (cynicism, fate control, religiosity, social complexity, and reward for application)	Leung et al. (2002)	30
	<i>Individualism and Collectivism (Idiocentrism and Allocentrism)</i> (4 items each for vertical (hierarchical) individualism, vertical collectivism, horizontal (egalitarian) collectivism, and horizontal individualism)	Triandis & Gelfand (1998)	16
	<i>Values</i> (Items representing 10 values-clusters proposed by Schwartz; Tradition, Self-direction, Achievement, Conformity, Universalism, Hedonism, Security, Benevolence, Stimulation, Power)	Lindeman & Verkasalo (2005)	10
	<i>Family values</i> (four selected for each of two dimensions: hierarchy (focused on gender roles) and relationships (i.e., cohesiveness reputation, obligations)),	Georgas (1989); van de Vijver et al. (2006)	8
	<i>Isms dimensions</i> (Tradition-Oriented Religiousness, Subjective Spirituality, Unmitigated Self-Interest, Communal Rationalism, and Inequality-Aversion)	Saucier (2000, 2013)	46
	<i>Moral Foundations</i> (Harm/Care, Justice/Fairness, Loyalty, Authority, and Purity/Divinity)	Moral Foundations Questionnaire; (MPQ-20; Graham et al., 2011)	22
CNI type	Variables	Citation	Items

Mindset-based CNI variables	<i>Religiousness and devout behaviors</i> (religion, religious experiences, practices, and meeting-attendance)	Duke Religion Index; Koenig et al. (1997)	5
	<i>Machiavellianism</i>	Saucier et al. (2014)	5
	<i>Nationalism</i> (4 items based on Ethnonationalism; 2 items capturing a Multiculturalist Civic Nationalism)	Saucier (2014)	6
	<i>Extremist thinking patterns</i>	Saucier et al. (2009); Stankov et al. (2010)	17
	<i>Proneness to aggression</i> (readiness to aggress vengefully to insults or slights to honor, within a “culture of honor” syndrome)	Henry (2009)	3
	<i>Regularity-norm behaviors*</i> (alcohol, sex, sleeping arrangements, and beliefs about ancestors, spirit-possession, and sorcery and witchcraft; referent-shift format was used)	literature including Heine (2020); Levinson & Malone1(1980) (Shen-Miller et al., 2013)	6
	<i>Materialism</i>		
Personality-based CNI variables	<i>Big Six model</i> (Conscientiousness, Extraversion, Agreeableness, Originality, Honesty/Propriety, Resiliency)	36QB6 measure; Thalmayer et al. (2011)	40
Predictor Variables	<i>Socioeconomic Status (Parental Education, Mother’s education, Father’s education)</i>	demographics	2
	<i>Location Type: Urban vs. Rural origin</i>	demographics	1
	<i>Age</i>	demographics	1

Note: *Referent shift format was used for these items; respondents described characteristics of people in their country rather than of themselves, with items usually beginning with “In this society . . .”

Analyses

The outlined analyses will apply to both Study 1 and Study 2, except where specific distinctions are made.

RQ 1: How to generally quantify CNI?

Weston et al. (2024) proposed a Multilevel modeling based method for quantifying the similarity between individual and cultural normative profiles. This method allows for

regularizing the person-level CNI estimates especially for those with smaller number of item responses, while roughly controlling for social desirability (SD)— the tendency to present oneself in a favorable light, adhering to values and characteristics that society deems positive— of item responses. Ipsatization of self-ratings, will account for response styles and allow for a standardized correlation-like interpretation of CNI's.

Level 1

(Model 1)

$$Self-Rating_{ipc} = \beta_{0pc} + \beta_{1pc}(CountryAverage)_{ipc} + \beta_{2pc}(MultiCountryAverage)_i + r_{ipc}$$

Level 2

$$\beta_{0pc} = \mu_{00c}$$

$$\beta_{1pc} = \mu_{10c} + u_{1pc}$$

$$\beta_{2pc} = \mu_{20c}$$

Level 3

$$\mu_{00c} = \gamma_{000}$$

$$\mu_{10c} = \gamma_{100} + u_{10c}$$

In Level 1, items i are nested within each participant p wherein the self-rating profile for each participant is regressed on the country aggregate profile and the overall normative profile. The Level 2 randomized slopes are conceived as the CNI estimates for each participant p . CNI can be viewed as the degree to which a psychological-domain-based (e.g., personality, mindset) profile conforms to commonly shared or population-wide patterns of trait/attribute expression—essentially how “average” or “typical” one’s profile appears relative to a given cultural or societal standard. Next, the Individuals are nested within countries c in Level 3. The overall multi-country average across countries is added as a fixed effect in Level 1 to control for

normativity desirability confounds (Wood & Furr, 2016). Models will be estimated using the lme4 (Bates et al., 2015) and lmerTest (Kuznetsova et al., 2017) packages in R.

RQ2: What person characteristics such as age, SES and location type (urban vs. rural) predict CNI? How is CNI related to well-being?

CNI in the PE-fit literature has often demonstrated associations with variables like age (e.g., Weston et al., 2024), education (e.g., Lanning et al., 2024) and most commonly, well-being (e.g., Georgas, 1989; van de Vijver et al., 2006). Furthermore, although personality has been shown to vary across rural vs. urban location types (e.g., Atherton et al., 2024), no known study, as of the writing of this paper, has explored the association between cultural normativity (or PE-fit) and urbanicity of locations (i.e., the degree to which a location, or the origin of participants, is urban versus rural). Here the relationship between mindset- and personality-CNI will be assessed by moderating Level 2 slopes by age, SES, location types (urban vs. rural) and life satisfaction. An analysis of variance (using Type III sums of squares)⁴ with degrees of freedom estimated using Kenward-Roger method, was conducted using the car package (Fox & Weisberg, 2019) to assess the significance of categorical predictors. For estimating simple intercepts and slopes emmeans (Lenth, 2021) and interactions (Long, 2022) packages will be used.

Level 1 (Model 2.1)

$$Self-Rating_{ip} = \beta_{0p} + \beta_{1p}(CountryAverage)_{ip} + r_{ip}$$

Level 2

$$\beta_{0p} = \mu_{00}$$

$$\beta_{1p} = \mu_{10} + \mu_{11}(SocialPredictor)_{0p} + u_{1p}$$

⁴ Type III sum of squares was the choice here as it tests the extent to which the moderator interaction explains variability in the model, above and beyond other main and random effects

SocialPredictors (Life Satisfaction, Mother's education, Father's education and location type) will be assessed as a function of the similarity between participant profile j and the normative profile. The extent to which *SocialPredictor* predicts CNI or Level 2 random slopes (β_{1p}) (i.e. moderate the relation between an individual's profile and that of their country), will allow for exploring psychological constructs that are key predictors of CNI.

In addition to the above, the MLM framework also allows for understanding the predictive capacity of a construct when the outcome is CNI. This will enable an exploration of whether SWB differs across varying levels of CNI. CNI estimates (random slopes extracted from Model 1), along with their quadratic transformations, were employed to predict SWB (Weston et al., 2024)⁵.

Level 1 (Linear Model 2.2.1)

$$\text{Well-Being}_{ic} = \beta_{0c} + \beta_{1c}(\text{CNI})_i + R_{ic}$$

Level 2

$$\beta_{0c} = \mu_{0c} + u_{0c}$$

$$\beta_{1c} = \mu_{1c}$$

Level 1 (Quadratic Model 2.2.2)

$$\text{Well-Being}_{ic} = \beta_{0c} + \beta_{1c}(\text{CNI})_i + \beta_{2c}(\text{CNI})_i^2 + R_{ic}$$

Level 2

$$\beta_{0c} = \mu_{0c} + u_{0c}$$

$$\beta_{1c} = \mu_{1c}$$

⁵ While the CNI estimates extracted from Model 1 already account for the nested structure of the data (by variation accounting for country level variation in Level 3), in this model, the randomization of intercepts specifically addresses the nesting of SWB within countries.

$$\beta_{2c} = \mu_{2c}$$

The quadratic CNI estimates aided in exploring the patterns of association across extreme CNI scores and well-being. Models were tested for heteroscedasticity with White's (1980) test, using the *whitestrapped* package (Pérez, 2020). Only significant quadratic terms will be retained in the model.

RQ3: Does CNI differ across levels of Personality and Mindset traits at the individual and community level?

The bulk of research has primarily focused on personality-based PE-fit (here, personality-CNI). While some studies have focused on values (e.g., Bruna, 2022), they do not employ a profile-centered approach or have the breadth of cultural variables as in this study. In this study we hypothesize that CNI is likely to confer differing associations with mindset and personality traits at both the individual (CNI and individual-level trait scores) and community levels (CNI and country-level trait scores). Individual and community level trait scores could help throw light on different aspects of CNI; while the prior is more relevant to person/micro level predictors of CNI, the latter focuses on society/macro level characteristics that could CN. For instance, tightness vs. looseness (Gelfand et al., 2011) or individualism vs. collectivism (Triandis, 1995) as displayed by countries may have a greater impact on CNI as compared to the variations displayed by individuals on these variables. When a person endorses a statement such as “There are many social norms that people are supposed to abide by in this country,” it can affect the extent to which they align with their overall cultural thinking, with potentially greater pressure to conform when the community in general also highly endorses the same. Amongst the mindset variables, GLOBE (House et al., 2011) variables (e.g., *future orientation*, *gender egalitarianism*, *assertiveness*, *ingroup collectivism*, *power distance*, *uncertainty avoidance*) are expected to

indicate greater associations with CNI, especially at the country-level. The GLOBE measure captures the “as is” (how things are done in a society—the norms, behaviors, and practices that are common and observable) and “should be” (idealized values and aspirations of a society—what people believe should be the norms and practices) aspects of how things are in one’s society. The extent to which an individual aligns with their culture could be affected by the degree of endorsement on these cultural dimensions displayed by communities that they come from. Alignment with one’s cultural group could potentially be affected by whether the group members generally believe that the other group-members are vocal about their opinions (*assertiveness*) or respect power hierarchy (*power distance*) or focused on the present vs. future (*future orientation*). In case of personality one would expect the more desirable poles of Big Six — *Conscientiousness* (C; organization, diligence, and prudence.), *Honesty* (H; sincerity, fairness, and modesty), *Agreeableness* (A; patience, tolerance, and gentleness), *Resilience* (R; adaptability, perseverance, emotional stability), and *Extraversion* (E; sociability, liveliness, and assertiveness.) — to be positively related to CNI. For C, H, and A this has to do with them being aspects of *Social Self-Regulation* (SSR; ability to regulate emotions and behaviors in ways that foster positive social interactions). In case of E, extraverts are more likely to frequently or intensely engage in social interactions which enable them to sense more fully ‘how things are done’ with respect to others in the world. As for O, this also might relate positively to CNI if the culture values O. Amongst the Big Six, O followed by C can be seen as having the most cultural content/overlap.

To test this idea CNI was predicted as a function of trait scores for each participant (*individual-level*) and country (*community level*). The significance of categorical moderators was tested using analysis of variance (Type III sums of squares) with degrees of freedom

estimated using Satterthwaite's method. Non-linear relationship between CNI and personality traits was tested by adding quadratic terms to the model to explore whether the relationships differ across varying levels of personality.

Level 1 (Linear Model 3.1)

$$Self-Rating_{it} = \beta_{0p} + \beta_{1t}(CountryAverage)_{it} + r_{it}$$

Level 2

$$\beta_{0p} = \mu_{00}$$

$$\beta_{1t} = \mu_{10} + \mu_{11}(Trait)_{1t} + u_{1t}$$

Level 1 (Quadratic Model 3.2)

$$Self-Rating_{it} = \beta_{0p} + \beta_{1t}(CountryAverage)_{it} + r_{it}$$

Level 2

$$\beta_{0p} = \mu_{00}$$

$$\beta_{1t} = \mu_{10} + \mu_{11}(Trait)_{1t} + \mu_{12}(Trait^2)_{1t} + u_{1t}$$

RQ 4: Does Mindset-CNI perform better than Personality-CNI?

Although there has been supporting evidence for the predictive capacity of person-environment value congruence for well-being outcomes (Sagiv & Schwartz, 2000), less focus has been put on the differential capacities of mindset and personality variables in this formulation. Mindset variables can be considered more relevant to CNI given that values, beliefs, and perceived norms are more cultural than are an individual's personality traits. Mindset-CNI, due to its greater potency for indexing cultural contents, is therefore expected to exhibit stronger relations with urban vs. rural origin and parental education. Furthermore, the extent to which

Mindset-CNI performs better at predicting well-being outcomes will also be tested (see Model 2.2.1 and Model 2.2.2).

Auxiliary RQ: Can overlap between Personality-CNI variables and predictors such as well-being affect the observed results?

It is well established that well-being is strongly related to personality variables such as emotional stability, and some aspects of intellect/openness, conscientiousness, extraversion, and agreeableness (e.g., Ozer & Benet-Martínez, 2006). A commonly held view, but one which is less frequently tested, is that this relationship is due to an overlap in the item content across the measures of these variables. To address this concern unconfounded Personality-CNI estimates will be computed after dropping items for variables (e.g., conscientiousness, extraversion) that are found to be correlated with subjective well-being. Associations between Personality-CNI, both as a predictor and outcome variable, and subjective well-being will be then computed.

Preregistration and Transparency

This study was preregistered using the Open Science Framework ([link](#)). The code (.qmd files) will be made available upon request.

CHAPTER III: STUDY 1

Results

RQ 1: Quantifying CNI

Six types of CNI were computed across Mindset and Personality measures. A comprehensive Mindset-CNI was computed along with three domain-specific (GLOBE, Fanaticism and Isms) CNI's, each focusing on a particular facet of mindset constructs. This approach allowed for both a broad assessment of mindset-based cultural normativity and more targeted examinations of specific mindset domains as discussed below.

The GLOBE (Global Leadership and Organizational Behavior Effectiveness; House, 2004), was designed to assess cultural dimensions that influence leadership and organizational behavior across different societies. This framework identified nine cultural dimensions based on perceptions about one's cultural group: *Performance Orientation* (the value placed on performance improvement and the rewarding of achievements), *Assertiveness* (support for confrontation and aggressive approach in relationships), *Power Distance* (acceptance and expectation of unequal power distribution among society's members), *Uncertainty Avoidance* (comfort with ambiguity and the preference for structured situations and clear rules to reduce unpredictability), *In-Group Collectivism* (expression of group loyalty and cohesiveness), *Institutional Collectivism* (encouragement for organizational and societal practices for collective distribution of resources and collective action), *Gender Differentiation* (the perpetuation of gender inequality), *Future Orientation* (emphasis on long-term commitments and planning), and *Humane Orientation* (support for fairness, altruism, generosity). Each dimension captures specific cultural norms and values that shape interpersonal behavior and attitudes.

The Fanaticism measure was ideated to measure militant-extremist patterns of thinking that may drive individuals towards violent behaviors (Saucier et al., 2009). Three authors identified item statements that focused, in effect, on *Balkan-based* extremism, *Islam-based* extremism and *pancultural* extremism — each item’s derivation could be traced to one of three authors, with one author drawing largely on experience with and texts involving 1990s-era extremism in the Balkans, another drawing largely on examination of texts from Islam-associated extremists, and the third drawing from an array of sources around the world oriented toward captured pancultural tendencies in extremism. Content-wise, the items tended to fall into three broad domains as identified in factor analysis (Stankov et al., 2010): *Pro-violence* (degree to which war is justified and violence is advocated as a solution), *Vile World* (tendency to view the world as a an evil and immoral place) and *Utopianism/Divine Power* (proclivity to to rationalize hostile thoughts and acts of violence by appealing to the sacred). As such, the Fanaticism measure not only serves as an indicator of extremist thinking but also highlights areas of potential conflict within and across cultural groups. It focuses on certain narrow but highly consequential aspects of culture, involving stark moralistic worldviews associated with the perceived necessity for violence, armed resistance, or war (i.e., what might lead to a “culture of violence”). Among the mindset variables, this measure focuses on concepts that are particularly divisive, as it captures attitudes that tend to polarize individuals into opposing ideological extremes.

The Isms measure is grounded in a lexical approach to study social attitudes, assuming that attribute nouns ending in the suffix -ism (e.g., individualism, feminism) sediment major interindividual differences in social beliefs and attitudes (Saucier, 2000). Isms broadly consist of five domains (Saucier, 2013): *Tradition-oriented Religiousness* (Alpha; adherence to religious,

spiritual, and institutional beliefs, views on the nature of good and evil, moral absolutes, and social norms like childbearing and economic systems), *Subjective Spirituality* (Delta; focus on concepts like intuition, mysticism, and the connection between the natural world and spirituality, assess beliefs in enlightenment, mystical unity with existence, the divinity of the universe, and the spiritual nature of objects and life), *Unmitigated Self-Interest* (Beta; emphasis on attitudes related to pursuit of sensory pleasure and material wealth as ultimate goals, the belief that everything can be explained by physical phenomena, belief in the superiority of one's own ethnic group), *Communal Rationalism* (Gamma; assess preference for constitutional rule, belief in natural goodness of humans, importance of reason and facts), and *Inequality-Aversion* (rejection of class privilege, immigration restrictions, military ideals). This structure has been largely replicated in an analogous study with Romanian isms terms (Krauss, 2006), and partially replicated in a study of Chinese-language ism-equivalents in Taiwan and mainland China (Chen et al., 2018).

Apart from GLOBE, Fanaticism and Isms measures, Mindset-CNI also included Social Axioms and Values measures that assess the fundamental beliefs in individuals, serving as guiding principles. Social Axioms reflect generalized beliefs about the world and the relationships between individuals and their environment. Values, on the other hand, represent more stable, enduring principles that guide individuals in evaluating actions and outcomes, serving as motivational constructs that prioritize what is deemed desirable or important in life. The former three CNI's can be seen as subsets of Mindset-CNI.

With respect to personality, Personality6-CNI can be seen as a subset of Personality7-CNI that consisted of the psychopathological construct of Disintegration, which goes beyond the Big Six dimensions (Thalmayer & Saucier, 2014). *Disintegration* (tendency to display

“psychotic-like” characteristics) has been argued to lie within the domain of personality, but be relatively independent of major broad personality dimensions (Knezevic et al., 2017). The present study aims to assess whether the inclusion of this psychopathological dimension enhances the conceptualization of Personality-CNI beyond the Big Six – *Conscientiousness* (degree of organization, dependability, and goal-directed behavior), *Agreeableness* (extent to which one is cooperative, patient, and willing to work harmoniously with others), *Honesty/Propriety* (tendency to be truthful, ethical, and socially responsible), *Extraversion* (degree to which one is outgoing, talkative, and sociable), *Originality* (predisposition for creativity and innovation) and *Resiliency* (tendency to adaptively self-regulate in times of adversity, stress, or challenges).

These varying conceptualizations of the CNI are critical for capturing the nuanced nature of cultural normativity across diverse psychological constructs. Especially, the separation of the broader Mindset-CNI into its three narrow variants (GLOBE-, Fanaticism- and Isms-CNI) help identify which aspects of culture normativity (i.e., alignment) might be most central or important in terms of relation to personality and other mindset variables, and specifically in relation to important outcomes (e.g., well-being). Each conceptualization of CNI reflects on a distinct psychological domain of cultural alignment, potentially offering distinct insights into the complex interplay between individual dispositions and country-level norms. To further understand this complexity, heterogeneity within each CNI was quantified using complexity metrics (see Figure 1). These metrics include parallel analysis and the number of unrotated principal components required to explain at least 50% of the variance (Merenda, 1997; Peterson, 2000), providing insights into the dimensional structure of the various CNIs. Mindset-CNI

indicated the highest level of complexity, owing to the the greater number of items and psychological domains constituting this CNI in comparison with other types.

The highest correlation across CNI estimates was observed between the two mostly overlapping Personality-CNI types ($r = .92$) followed by Mindset- and Fanaticism-CNI ($r = .89$) (see Figure 2). The smallest correlation was observed between Personality-6 and Globe-CNI ($r = .27$). Notably, Mindset-CNI demonstrated strong correlations with all other CNI types, including both Personality-CNI variants. All correlations were positive, with most ranging from moderate to high values, indicating a certain degree of systematicity across the varying conceptualizations of CNI.

Figure 2
Model Complexity Measures Across CNI Models

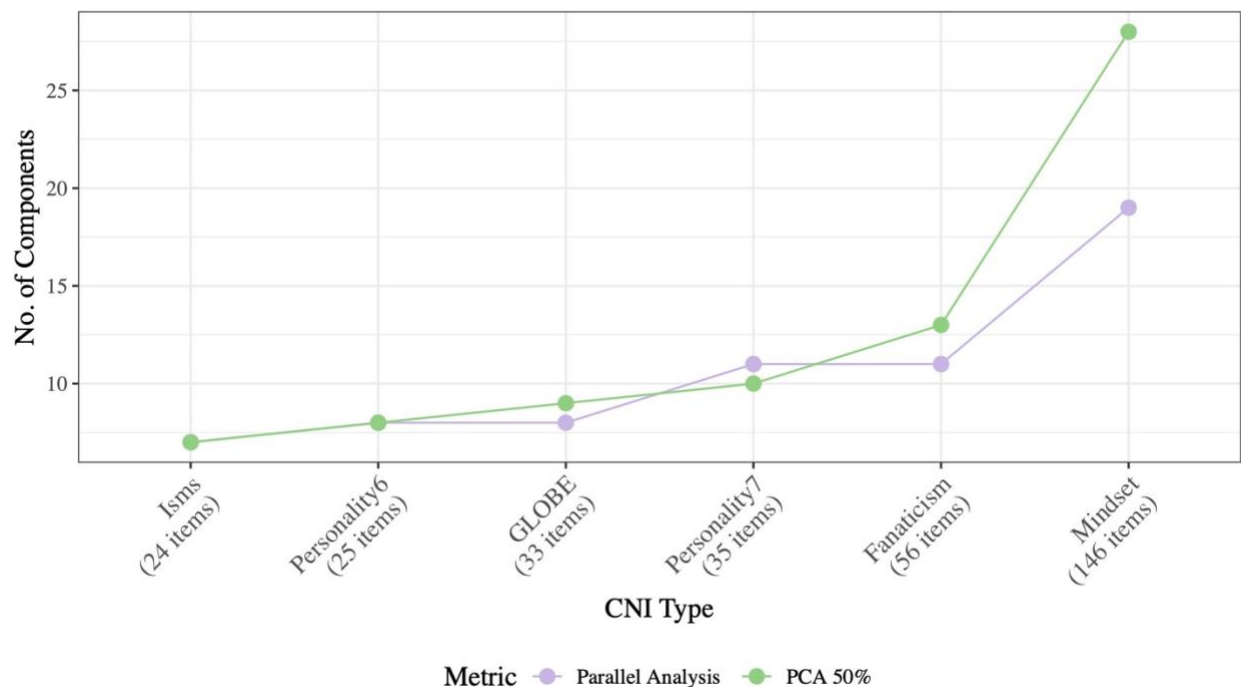
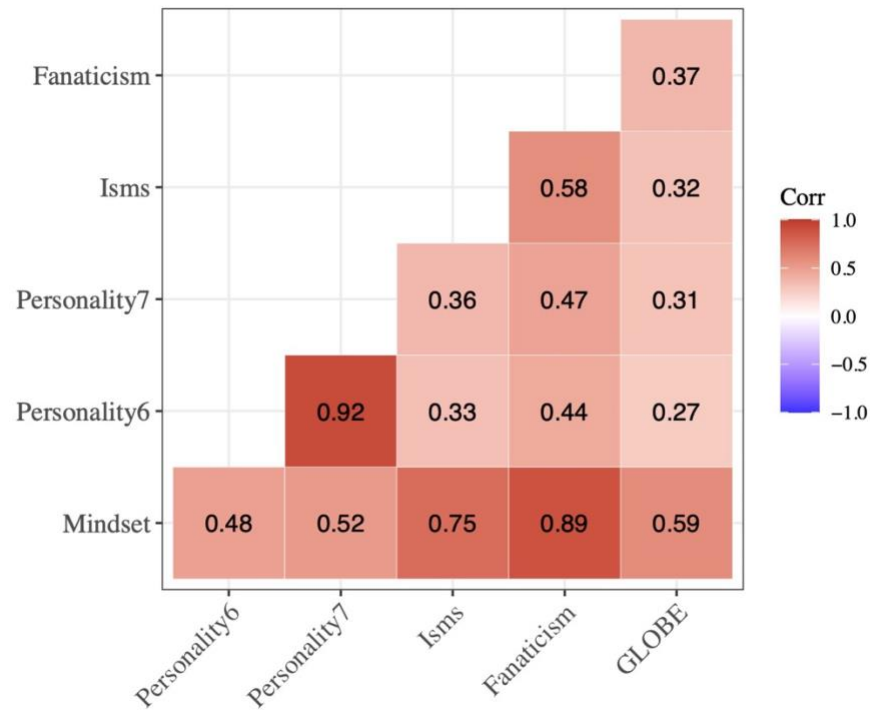


Figure 3

Correlations Between CNI Types



The average CNI estimate (Table 3.1) computed after controlling for the multicountry average was found to be the highest for Ism-CNI ($b = 0.60$, 95% CI [0.57, 0.64], $p < .001$), followed by Fanaticism-CNI ($b = 0.58$, 95% CI [0.53, 0.63], $p < .001$) and Mindset-CNI ($b = 0.60$, 95% CI [0.53, 0.61], $p < .001$). The two types of Personality CNI's produced comparable averages (Personality6-CNI; $b = 0.50$; 95% CI [0.44, 0.55], $p < .001$ and Personality7-CNI; $b = 0.51$; 95% CI [0.45, 0.56], $p < .001$). The lowest CNI average was observed for GLOBE-CNI ($b = 0.46$, 95% CI [0.41, 0.51], $p < .001$) suggesting a possibly greater within culture heterogeneity. Estimated standard deviation of CNI's (random slopes) across participants ($\hat{\sigma}_{ID}$) and country ($\hat{\sigma}_{country}$) ranged across values of .15 to .17 and .05 to .08 respectively.

Table 3.1

Mindset and Personality Cultural Normativity Index (CNI) Models

	Mindset				Personality	
	Mindset	Ism	GLOBE	Fanaticism	Personality 6	Personality 7
CNI	0.57*** [0.53, 0.61]	0.60*** [0.57, 0.64]	0.46*** [0.41, 0.51]	0.58*** [0.53, 0.63]	0.50*** [0.44, 0.55]	0.51*** [0.45, 0.56]
Multi Country Average Profile	0.01 [0.00, 0.02]	0.01 [0.01, 0.04]	0.02 [0.01, 0.05]	0.01 [0.01, 0.03]	0.00 [0.03, 0.04]	0.00 [0.03, 0.03]
SD CNI (across people)	0.15	0.16	0.16	0.19	0.17	0.17
SD CNI (across country)	0.05	0.05	0.07	0.06	0.07	0.08
SD (Observations)	0.81	0.77	0.86	0.80	0.84	0.84
Num.Obs.	382228	62832	86130	146496	65350	91560

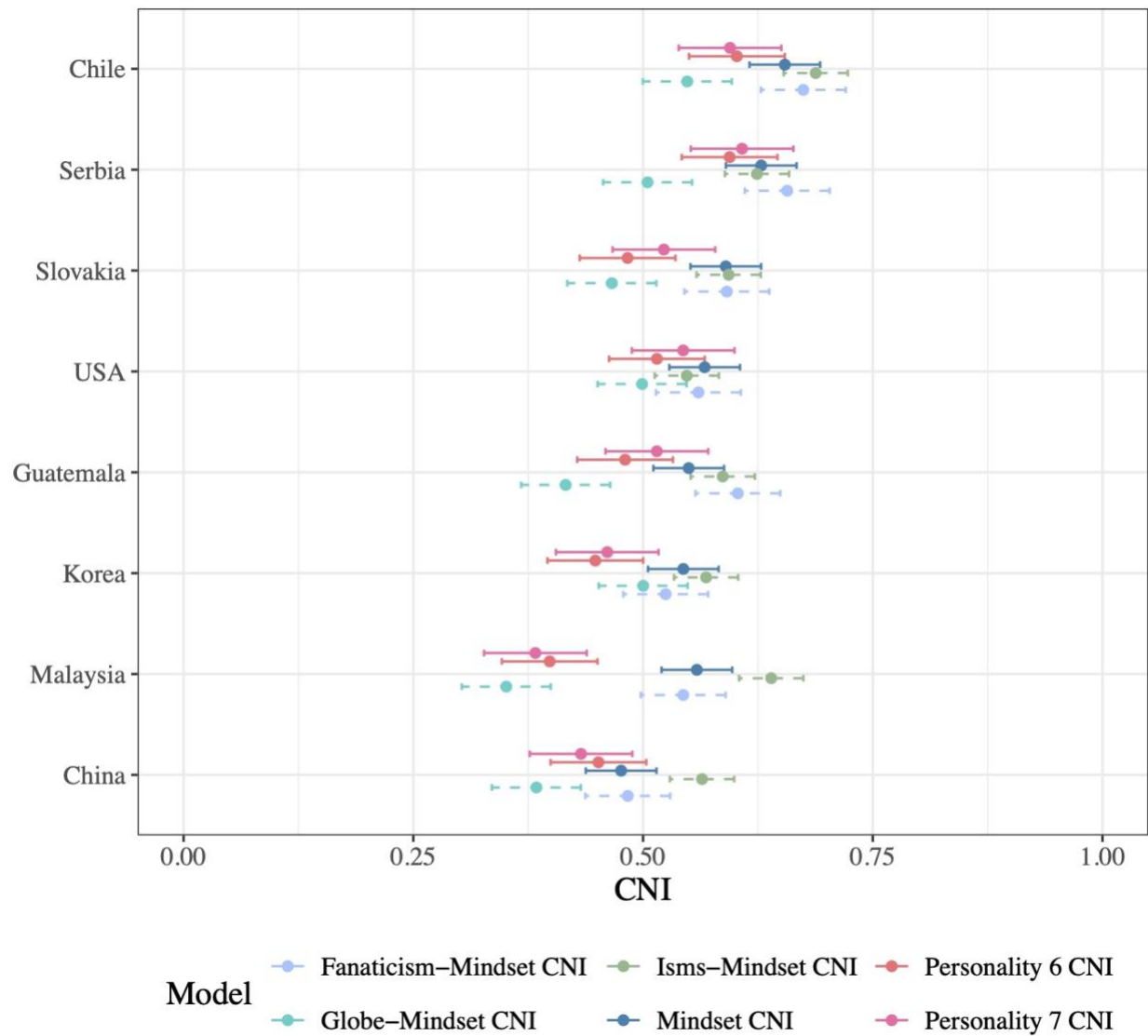
Note:(***) $p < 0.001$, (no stars) $p \geq 0.1$; From Model 1, CNI = random effect (μ_{10c}), Multi Country Average Profile = fixed effect (β_{2pc}), SD CNI = Level 2 residual variance, SD CNI (across country) = Level 3 residual variance, SD (Observations) = Level 1 residual variance.

Personality7-CNI (*CI range* = 0.11) followed by Personality6-CNI (*CI range* = 0.10) demonstrated the highest degree of variability, as evidenced by the widest confidence intervals. In contrast, the Isms-CNI (*CI range* = 0.07) and Mindset-CNI (*CI range* = 0.08) exhibited substantially lower variability, characterized by narrower confidence intervals. With respect to CNI estimates across countries, GLOBE-CNI consistently yielded the lowest average estimates (Figure 3). In contrast, the Fanaticism- and Isms-CNI produced the highest average CNI estimates. Overall, average Personality-CNI models fell in a similar range across countries while average Mindset-CNI consistently ranged higher across countries. Interestingly, low Personality-CNI indices tended to be in Asia, and the most Western populations tended to have higher ones. Malaysia reported greater variability across types of average CNI estimates in comparison to other countries. Chile reported the highest and China the lowest overall combined average CNI estimates. The USA exhibited substantial overlap in average CNI estimates across types, suggesting less differentiation among CNI measures in assessing culture-fit compared to other countries. Considering Mindset-CNI, Chile indicated the highest and China the lowest average estimates.

At the person level, CNI estimates showed the widest range of 1.26 for Fanaticism-CNI (-.43 to .84) and the narrowest range of 0.72 for GLOBE-CNI (-.02 to .70). Personality7-CNI exhibited greater variability with a range of 0.95 (-.15 to .80) compared to Personality6-CNI. Mindset-CNI produced slightly more variability with a range of .99 (-0.18 to 0.80) than Personality-based-CNI.

Figure 4

Country Means and Confidence Intervals for CNI Estimates: Six CNIs



Note: Error bars indicate confidence intervals.

RQ2: What person and community characteristics are associated with CNI?

Individual and country-level mindset ($n = 21$) and personality ($n = 7$) variables were tested as linear and quadratic moderators for each CNI type. For each trait scaled scores were computed at the individual-level and at the country-level (country average using individual-level

scores) which were then tested for their predictive capacity, in the form of linear or non-linear associations, of CNI's (random slopes at Level 2). All continuous moderator variables were mean-centered to facilitate interpretation of effects. The overall range of effect sizes were small at the individual-level, with relatively larger effects at the country-level for quadratic ($range = 0.83$, $min = -0.55$, $max = 0.29$) as compared to linear effects ($range = 0.18$, $min = -0.10$, $max = 0.08$). Two approaches are employed to discuss the results: *model-focused* view emphasizes both the level at which scaled trait scores are computed (individual vs. country) and the type of predictive relationships (linear vs. quadratic) modeled for predicting CNIs. The *trait-focused* view concentrates on the strongest overall effects across each CNI type. Although the observed effects discussed in these views may overlap, examining them through these approaches offers interesting insights into how CNI and trait associations play a role from different perspectives. All effect sizes are provided in the supplemental materials.

Model-Focused View

Extraversion was the strongest linear predictor of CNI at the individual-level (Table 3.2), predicting Personality6-CNI followed by Personality7-CNI. Interestingly, overall, relatively strong predictive effects consisted of personality traits predicting Personality-CNI. In case of quadratic effects, *Institutional Collectivism* indicated strongest and negative associations with GLOBE-, followed by Mindset- and Fanaticism-CNI (Table 3.3). Absolute effect sizes were consistently small for linear ($< .06$) and for quadratic ($< .02$) effects. Overall, while the strong linear effects were marked by personality traits as predictors and Personality-CNI as criterion variables, strong quadratic effects were characterized by mindset (mainly GLOBE) traits and while both Mindset- and Personality-CNI were fairly equally represented as criterion variables.

For country-level associations, *Institutional Collectivism* once again indicated strongest linear and negative associations with GLOBE-CNI (Table 3.4). Most of the linear effects for Mindset variables were observed for GLOBE traits especially indicative negative associations with CNI. Interestingly while Institutional Collectivism indicated positive linear associations with CNI at the individual-level, negative effects were observed at the country-level. Also, while the linear country-level associations consisted of mostly Dynamism related (Extraversion, Resilience and Originality) traits were positively associated with CNI, Social Self-Regulation related trait – Agreeableness – indicated a negative association.

While the absolute effect sizes for linear effects were consistently small for linear effects ($< .1$), quadratic effects (Table 3.5) indicated larger and substantial associations (highest ones with absolute magnitude $> .1$). *Agreeableness* indicated strongest and negative associations with Mindset-, followed by Isms- and Fanaticism-CNI. *Assertiveness* and *Institutional Collectivism* were other mindset traits that also indicated relatively stronger associations with CNI. These trends indicate the dominance of GLOBE (e.g., *Assertiveness*, *Institutional collectivism*, *Future orientation*), and personality (e.g., *Agreeableness*, *Extraversion*, *Resilience*) traits with smaller representation of Isms traits (e.g., *Communal Rationalism*) as either quadratic or linear predictors of CNI.

Table 3.2

Study 1: Strongest Linear Associations With CNI at the Individual-Level

CNI type	Moderator trait	Est	95% CI
Personality 6	Extraversion*	0.052	[0.05, 0.055]
Personality 7	Extraversion*	0.048	[0.045, 0.05]
Personality 6	Resilience*	0.037	[0.034, 0.04]
Personality 6	Agreeableness*	0.036	[0.033, 0.039]
Personality 7	Resilience*	0.035	[0.032, 0.038]
GLOBE	Gender Differentiation†	-0.034	[-0.037, -0.03]
Isms	Gamma (Communal Rationalism) †	0.032	[0.03, 0.034]
Personality 6	Originality/Virtuosity*	0.032	[0.028, 0.035]
Personality 7	Agreeableness*	0.031	[0.028, 0.034]
Personality 6	Conscientiousness*	0.031	[0.028, 0.034]
Fanaticism	Proviolence†	-0.030	[-0.031, -0.029]
Personality 7	Originality/Virtuosity*	0.030	[0.026, 0.033]
Personality 6	Honesty*	0.029	[0.027, 0.032]
GLOBE	Institutional Collectivism†	0.028	[0.022, 0.033]
Personality 7	Honesty*	0.026	[0.024, 0.029]
Personality 7	Conscientiousness*	0.026	[0.023, 0.029]
Personality 7	Disintegration*	-0.022	[-0.023, -0.021]
Mindset	Proviolence†	-0.021	[-0.022, -0.021]
Isms	Institutional Collectivism†	0.021	[0.015, 0.027]
Fanaticism	Extraversion*	0.020	[0.018, 0.023]

Note: * Personality trait † Mindset trait. Twenty highest absolute effect sizes (Est = $\beta_{1t}\mu_{11}$; interaction effect from Model 3.1) are reported for significant ($p<.001$) associations.

Table 3.3

Study 1: Strongest Quadratic Associations With CNI at the Individual-Level

CNI type	Moderator trait	Est	95% CI
GLOBE	Institutional Collectivism†	-0.011	[-0.014, -0.008]
Mindset	Institutional Collectivism†	-0.008	[-0.01, -0.006]
Fanaticism	Institutional Collectivism†	-0.007	[-0.01, -0.004]
Fanaticism	Assertiveness†	-0.005	[-0.008, -0.002]
Mindset	Assertiveness†	-0.005	[-0.007, -0.002]
GLOBE	Achievement orientation†	+0.003	[0.002, 0.004]
GLOBE	Ingroup Collectivism†	-0.003	[-0.004, -0.002]
GLOBE	Future orientation†	-0.003	[-0.004, -0.002]
Personality 6	Resilience*	-0.003	[-0.004, -0.002]
Personality 7	Extraversion*	-0.003	[-0.003, -0.002]
Personality 6	Extraversion*	-0.003	[-0.003, -0.002]
GLOBE	Uncertainty avoidance†	+0.002	[0.002, 0.003]
Personality 7	Ingroup Collectivism†	-0.002	[-0.003, -0.001]
Personality 6	Ingroup Collectivism†	-0.002	[-0.003, -0.001]
Isms	Communal Rationalism †	-0.002	[-0.003, -0.002]
Mindset	Ingroup Collectivism†	-0.002	[-0.003, -0.001]
Fanaticism	Communal Rationalism †	-0.002	[-0.002, -0.001]
Mindset	Future orientation†	-0.002	[-0.002, -0.001]
Personality 7	Future orientation†	-0.002	[-0.003, -0.001]
Personality 7	Resilience*	-0.002	[-0.002, -0.001]

Note: *Personality trait †Mindset trait. Twenty highest absolute effect sizes ($\text{Est} = \beta_{1t}\mu_{12}^2$; interaction effect from Model 3.2) are reported for significant ($p < .001$) associations.

Table 3.4

Study 1: Strongest Linear Associations With CNI at the Country-Level

CNI type	Moderator trait	Est	95% CI
GLOBE	Institutional Collectivism†	-0.099	[-0.117, -0.082]
Personality 7	Resilience*	0.077	[0.058, 0.096]
Personality 7	Extraversion*	0.072	[0.063, 0.081]
Personality 7	Future orientation†	-0.071	[-0.085, -0.057]
Personality 6	Future orientation†	-0.066	[-0.081, -0.052]
Personality 7	Originality/Virtuosity*	0.064	[0.055, 0.073]
GLOBE	Agreeableness*	-0.059	[-0.085, -0.033]
Personality 6	Extraversion*	0.058	[0.049, 0.068]
GLOBE	Gender Differentiation†	-0.058	[-0.069, -0.048]
GLOBE	Future orientation†	-0.056	[-0.069, -0.042]
Personality 7	Institutional Collectivism†	-0.055	[-0.073, -0.038]
Personality 6	Resilience*	0.055	[0.035, 0.075]
Fanaticism	Originality/Virtuosity*	0.054	[0.046, 0.063]
GLOBE	Extraversion*	0.053	[0.044, 0.062]
Personality 6	Originality/Virtuosity*	0.052	[0.043, 0.062]
Fanaticism	Agreeableness*	-0.051	[-0.076, -0.025]
Fanaticism	Extraversion*	0.050	[0.041, 0.059]
Mindset	Institutional Collectivism†	-0.048	[-0.061, -0.034]
Personality 7	Humane†	-0.046	[-0.054, -0.039]
Personality 7	Achievement orientation†	-0.046	[-0.055, -0.038]

Note: *Personality trait †Mindset trait. Twenty highest absolute effect sizes (Est = $\beta_{1t}\mu_{11}$; interaction effect from Model 3.1) are reported for significant ($p<.001$) associations.

Table 3.5

Study 1: Strongest Quadratic Associations With CNI at the Country-Level

CNI type	Moderator trait	Est	95% CI
Mindset	Agreeableness*	-0.545	[-0.671, -0.419]
Isms	Agreeableness*	-0.540	[-0.707, -0.374]
Fanaticism	Agreeableness*	-0.419	[-0.579, -0.259]
Fanaticism	Assertiveness†	0.285	[0.235, 0.335]
Mindset	Assertiveness†	0.269	[0.23, 0.309]
Personality 7	Institutional Collectivism†	-0.250	[-0.287, -0.213]
Isms	Assertiveness†	0.213	[0.16, 0.265]
Fanaticism	Institutional Collectivism†	-0.201	[-0.237, -0.165]
Personality 6	Institutional Collectivism†	-0.198	[-0.238, -0.158]
Personality 7	Assertiveness†	0.165	[0.112, 0.218]
Personality 6	Assertiveness†	0.154	[0.098, 0.21]
Mindset	Institutional Collectivism†	-0.152	[-0.18, -0.124]
GLOBE	Assertiveness†	0.138	[0.086, 0.19]
GLOBE	Institutional Collectivism†	-0.125	[-0.161, -0.088]
Fanaticism	Resilience*	0.098	[0.071, 0.125]
Mindset	Resilience*	0.072	[0.051, 0.094]
Isms	Resilience*	0.070	[0.042, 0.098]
Personality 6	Conscientiousness*	-0.061	[-0.095, -0.026]
GLOBE	Originality/Virtuosity*	-0.060	[-0.08, -0.04]
Isms	Future orientation†	0.058	[0.043, 0.074]

Note: *Personality trait †Mindset trait. Twenty highest absolute effect sizes ($\text{Est} = \beta_{1t}\mu_{12}^2$; interaction effect from Model 3.2) are reported for significant ($p < .001$) associations.

Trait-Focused View

To distinguish the most influential effects, the overall trends across CNI's and traits were considered. An initial scrutiny of twenty highest moderator effects (Table 3.6) revealed that the most pronounced effect sizes were observed at the country-level, exhibiting non-linear associations with CNI. Essentially, CNI associations with these mean-centered attributes measured at the country-level were quadratic (see Figure 5). Such effects when negative imply that the moderating effect of the trait is strongest near the overall mean for the trait (at zero, as

the trait is mean centered) and gets weaker at both extremes (as we move away from zero), creating a symmetrical inverted-U shape centered at the mean. In case they are positive, a U-shape representing the least optimum moderating effect at the mean level of the trait is implied, with increasing values as two move towards the extremes. The highest magnitude was observed for *Agreeableness* negatively associated with Mindset-, followed by Isms- and Fanaticism -CNI. Next was *Assertiveness* indicating positive nonlinear associations with all CNI types with the strongest relation observed for Fanaticism-, followed by Mindset-, Isms-, Personality 6- and GLOBE-CNI. *Institutional Collectivism* also emerged as a predictor across multiple CNI types — Personality7, followed by Fanaticism-, Personality6-, and Mindset-CNI. Overall *Agreeableness*, *Institutional Collectivism* and *Assertiveness* dominate as strongest traits predicting CNI. Beyond these, personality traits including *Resilience* and *Extraversion* and another GLOBE normative perception, *Future orientation* also displayed positive associations with CNI, although the effect sizes were small.

An interesting pattern emerges when considering the Big Two dimensions of *Dynamism*, or a proactive orientation towards life, emphasizing activity and social engagement, and *Social Self-Regulation (SSR)* or a warm and friendly orientation. While *Dynamism*-related constructs (*Resilience*, *Extraversion*, societal *Assertiveness*) tended to have positive linear and nonlinear associations with CNI, *SSR*-related attributes (*Agreeableness*, *Institutional Collectivism*) had negative ones. While positive linear and positive quadratic associations have a positive slope between the middle (here, mean as the variables were mean centered) and high end (here, above the mean) of the distribution (they could differ at the low end of the distribution) in common, similar negative associations have a negative association between the middle and the high end in common. At country-level then, higher *Dynamism*-related attributes were more positively

associated with CNI while SSR-related attributes were more negatively associated with CNI, as compared to moderate levels of these attributes. Lastly to comment on the CNI types observed here, while all CNI types were represented amongst the highest effect sizes, Personality7-CNI accounted for the largest number of highest effect sizes across traits, with topmost frequency of occurrence ($f = 5$), followed by Mindset-CNI ($f = 4$), and Fanaticism-CNI ($f = 3$), GLOBE-CNI ($f = 3$), Isms-CNI ($f = 2$), and Personality6-CNI ($f = 2$).

Studying the five strongest trait associations across CNI-types (Figure 6) revealed the dominance of personality traits and GLOBE traits in predicting CNI. While *Assertiveness* was positively associated with CNI in general, *Institutional collectivism* (with Personality6-, Personality7-, Mindset-, GLOBE-CNI) and *Agreeableness* (with Mindset-, Isms- and Fanaticism-CNI) indicated negative associations. *Resilience* (with Mindset-, Isms-, Fanaticism, Personality7-CNI) and *Extraversion* indicated positive and *Originality* negative associations across varying CNI-types, while *Conscientiousness* and *Future orientation* indicated ambiguity in the direction of relation with CNI.

Table 3.6

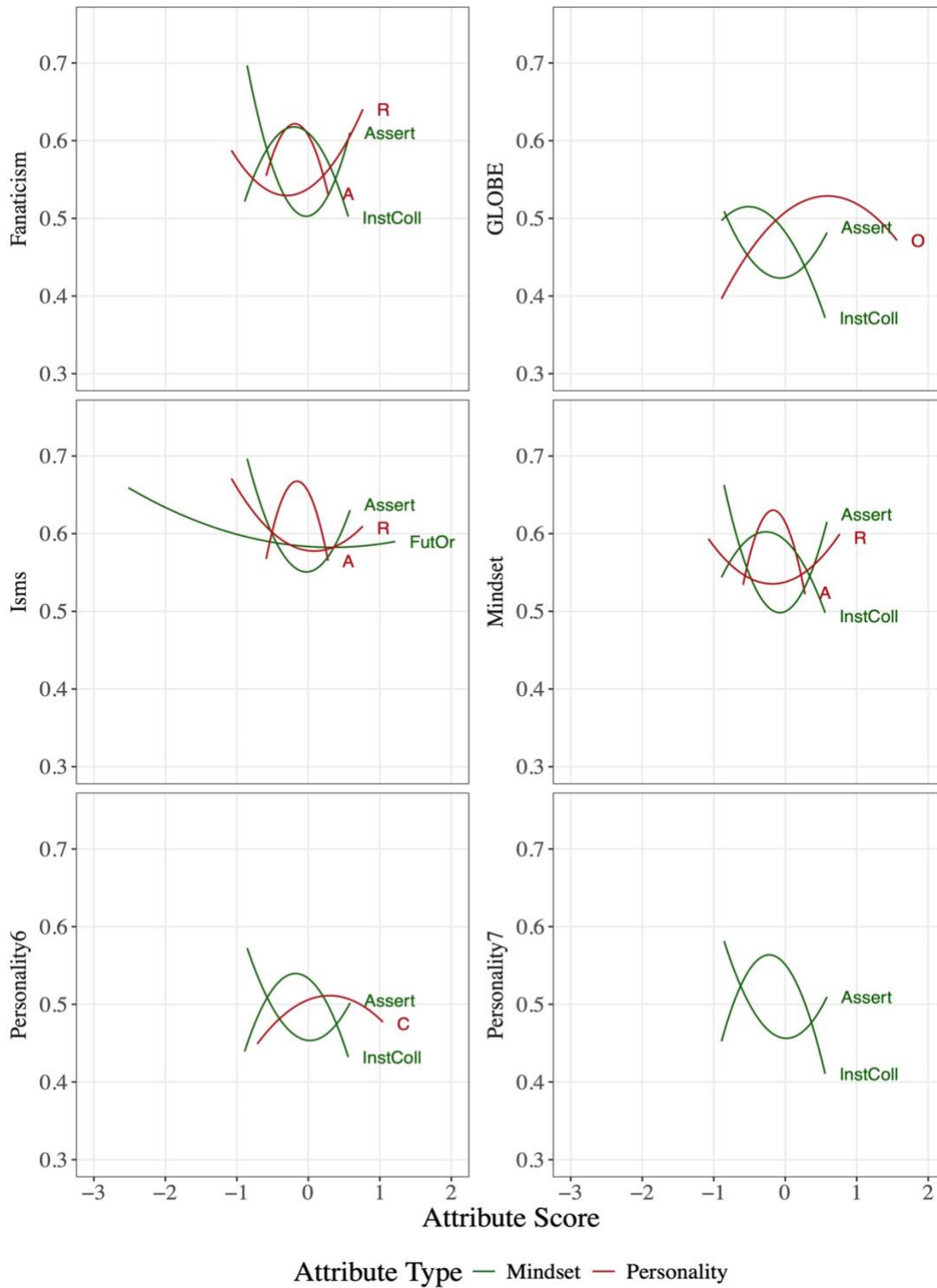
Study 1: Highest Effect Sizes Across Mindset and Personality Attributes

CNI type	Trait	Term	Est	95% CI
Mindset	Agreeableness (Personality)*	(b ²)	-0.545	[-0.671, -0.419]
Isms	Agreeableness (Personality)*	(b ²)	-0.540	[-0.707, -0.374]
Fanaticism	Agreeableness (Personality)*	(b ²)	-0.419	[-0.579, -0.259]
Fanaticism	Assertiveness (Mindset)*	(b ²)	0.285	[0.235, 0.335]
Mindset	Assertiveness (Mindset)*	(b ²)	0.269	[0.23, 0.309]
Personality 7	Institutional Collectivism (Mindset)*	(b ²)	-0.250	[-0.287, -0.213]
Isms	Assertiveness (Mindset)*	(b ²)	0.213	[0.16, 0.265]
Fanaticism	Institutional Collectivism (Mindset)*	(b ²)	-0.201	[-0.237, -0.165]
Personality 6	Institutional Collectivism (Mindset)*	(b ²)	-0.198	[-0.238, -0.158]
Personality 7	Assertiveness (Mindset)*	(b ²)	0.165	[0.112, 0.218]
Personality 6	Assertiveness (Mindset)*	(b ²)	0.154	[0.098, 0.21]
Mindset	Institutional Collectivism (Mindset)*	(b ²)	-0.152	[-0.18, -0.124]
GLOBE	Assertiveness (Mindset)*	(b ²)	0.138	[0.086, 0.19]
GLOBE	Institutional Collectivism (Mindset)*	(b ²)	-0.125	[-0.161, -0.088]
GLOBE	Institutional Collectivism (Mindset)*	(b)	-0.099	[-0.117, -0.082]
Fanaticism	Resilience (Personality)*	(b ²)	0.098	[0.071, 0.125]
Personality 7	Resilience (Personality)*	(b)	0.077	[0.058, 0.096]
Mindset	Resilience (Personality)*	(b ²)	0.072	[0.051, 0.094]
Personality 7	Extraversion (Personality)*	(b)	0.072	[0.063, 0.081]
Personality 7	Future orientation (Mindset)*	(b)	-0.071	[-0.085, -0.057]

Note: (b) = interaction effect ($\beta_{1t}\mu_{11}$) in the Linear Model 3.1, (b²) = interaction effect ($\beta_{1t}\mu_{12}$) in the Quadratic Model 3.2; Country-level*, Individual-level†; all effects are significant at $p < .001$.

Figure 5

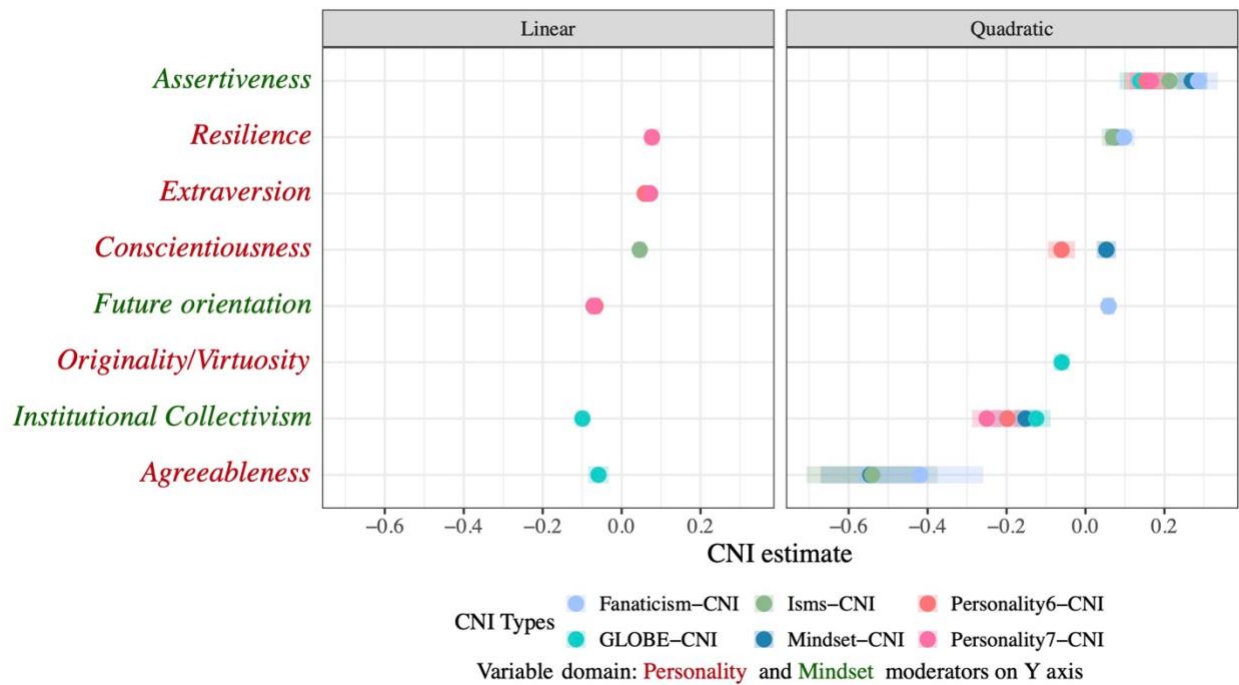
Study 1: Twenty Highest Nonlinear Country-Level Attribute Associations With CNI



Note: A = Agreeableness, O = Originality/Virtuosity, R = Resilience, Assrt = Assertiveness, InstColl = Institutional Collectivism, FutOr = Future Orientation; CNI type on the Y-axis.

Figure 6

Study 1: Five Strongest Attribute Estimates Across CNI Types



RQ 3: Is CNI related to SWB? Can CNI predict SWB?

Subjective Well-being (SWB) demonstrated weak predictive associations with CNI; largest significant linear effect was observed for Personality7-CNI at the individual-level ($b = 0.02$, 95% CI [0.017, 0.023], $p < .001$) and the smallest –across all statistically significant– effects for Personality6-CNI at the country-level ($b = 0.006$, 95% CI [0.001, 0.011], $p < .05$)⁶. Quadratic effects were either very small or not significant. These modest effects indicate that SWB is not a salient factor influencing CNI.

Next, computed models wherein CNI predicted SWB were also computed; this model flipped the direction of causal inference in comparison to the previous model. By assessing their

⁶ (b) = interaction effect ($\beta_{1t}\mu_{11}$) in the Linear Model 3.1, (b^2) = interaction effect ($\beta_{1t}\mu_{12}$) in the Quadratic Model 3.2

predictive power for SWB, relative importance of CNI types was evaluated. Measurement invariance of SWB was assessed to allow for causal attributions in these models. A series of increasingly constrained multi-group confirmatory factor analysis models were employed to evaluate configural, metric, scalar, and strict invariance. While the SWB measure demonstrated adequate support for configural (CFI = 0.94, TLI = 0.89, RMSEA = 0.13 [90% CI: 0.11, 0.14], SRMR = 0.04) and metric (CFI = 0.92, TLI = 0.91, RMSEA = 0.12 (90% CI [0.11, 0.13]), SRMR = 0.08) invariance across eight nations, non-invariance was observed at scalar (CFI = 0.78, TLI = 0.82, RMSEA = 0.17 (90% CI [0.16, 0.18]), SRMR = 0.13), and strict (CFI = 0.54, TLI = 0.72, RMSEA = 0.21 (90% CI [0.20, 0.21]), SRMR = 0.16) levels. These results suggest that while the basic structure of the scale could be similar across cultures, there may be differences in the strength of item-factor relationships, item intercepts, and item residuals across nations. A possible reasoning could be that the response scales for SWB in these data varied across countries (e.g., 5-point vs. 6-point Likert scales), and this could potentially affect measurement invariance, even somewhat if the scales were rescaled to be more identical. The difference in wording and numbering of scale points can influence how respondents interpret and select responses, leading to discrepancies that are unrelated to the underlying construct being measured. Cross-cultural variability in the interpretation of items is also a possibility. This can affect strength of the relationship between survey items and the latent factor (impacting configural and metric invariance) and could shift item intercepts (baseline level of an item when the latent trait is zero), affecting comparisons of mean levels between groups (impacting scalar invariance). Furthermore, the assumptions for homoscedasticity only held for GLOBE- and Personality6-CNI. Given the lack support for measurement invariance of SWB across cultures

and the presence of heteroscedasticity in the data, readers should approach the following results with caution.

Overall, CNI indicated predictive effects for SWB only at the individual-level; all the country-level effects were closer to zero and not significant. While all linear effects were significant, largest ones were observed for Personality6-CNI ($b = 6.12, p < .001$) followed by Personality7-CNI ($b = 5.76, p < .001$). GLOBE- ($b = 1.17, p < .05$) and Fanaticism-CNI ($b = 2.04, p < .001$) were amongst the lowest. Significant quadratic effects were observed for Isms- ($b^2 = 6.26, p < .005$) followed by Mindset- ($b^2 = 4.77, p < .05$) and Personality7-CNI ($b^2 = 4.60, p < .05$). indicating that SWB dropped at moderate levels of these CNI types as compared to the low and higher levels. Interestingly, while Personality6-CNI indicated significant linear associations, it indicated nonsignificant nonlinear ones ($b^2 = 4.12, p > .05$)⁷.

A series of comparative analyses examining the predictive capacity of all possible pairs of CNI types were conducted. This analysis aimed at identifying which combinations of CNI's provided the most robust explanation for variance in SWB and determining the relative predictive strengths of each CNI type. The results revealed that Personality-CNI consistently explained a significant portion of the variance in SWB after accounting for other CNI predictors in the model, except when paired with Isms-CNI and GLOBE-CNI. When included in the model alongside Mindset-CNI, Personality-CNI demonstrated greater predictive capacity, whereas Mindset-CNI's predictive power diminished in the presence of Personality-CNI. Similar trends were observed for Isms-CNI. These findings suggest the presence of *suppressor effects* (Tzelgov & Henik, 1991), where including Mindset-CNI or Isms-CNI (suppressor variables) in the model

⁷ (b) = fixed effect (β_{1c}) in the Linear Model 2.2.1, (b^2) = fixed effect (β_{2c}) in the Quadratic Model 2.2.2.

enhances the predictive validity of Personality-CNI by accounting for variance unrelated to the criterion, SWB. Another interesting observation was that Personality7-CNI emerged as a significant predictor of SWB, after controlling for Personality6-CNI, indicating some advantage of the additional items in the former.

Turning to the question of whether an overlap (or association) between the Personality-CNI variables and predictors such as SWB affect the observed relationship between the two, some unexpected findings were observed. As compared to previous findings (e.g., Winzer et al., 2021), a smaller overlap between SWB and personality traits (*Big Six* and *Disintegration*) were reported ($r < .28$), suggesting that the SWB and Personality-CNI associations are less likely to be affected by overlapping item content. Contrary to expectations of large effects, SWB indicated a medium-effect-size level correlations with *Extraversion* ($r = .27$, relatively higher in rank than others), *Disintegration* ($r = -.25$), *Virtuosity* ($r = .25$) and *Resiliency* ($r = .21$). One could argue that this still indicates some overlap with CNI. However, removing the items that measure the aforementioned traits reduces the Personality-based CNI measure to only 13 items, and missing data is likely to decrease this number even further. The smaller number of items may result in unstable CNI estimates. Given the relatively small overlap and insufficient items, the present data did not afford the examination of the effect of overlap between Personality-CNI and SWB on their relationship.

Discussion: Study 1

Six types of CNI were computed for participants across eight countries, and a series of multilevel models (MLMs) were conducted to explore the associations between personality traits, mindset attributes, and subjective well-being (SWB) with the various CNI types. Linear and quadratic associations were examined at both individual and country level attributes to

assess their impact on cultural normativity. These findings offer valuable insights into the characteristic nature of CNI and its broader implications.

The country mean CNI estimates were consistently in the .35-.65 range indicating that in general CNI, by any measure, is a large effect wherein the cultural environment, can be said to have a large effect on individual response. CNI estimates also varied by country, wherein Personality-CNI demonstrated greater variability in estimates compared to Mindset-CNI estimates. Several explanations may account for this. Individuals might be implicitly more aware of social desirability associated with various traits/attributes as against social norms that may vary more due to societal heterogeneity—such as ethnic or religious diversity—leading to increased variability. Conversely, in other cultures, there may be less general awareness of these norms. Having said that, there is a greater likelihood of between-culture disagreement on topics such as “whether god exists” (mindset construct) as compared to whether it is typical that one “worries a lot” (personality construct). Even within predominantly secular societies they might have a majority who don’t believe in God, while in deeply religious societies, belief in God might be nearly universal; but societies typically may not have social pressures that impose extreme or reduced tendencies to worry. Furthermore, the item content across the two CNI types also hint at individual differences in evaluations when self-references (Personality-CNI) are involved, compared to those of ideologies and belief systems (Mindset-CNI). While the former is internally situated, the latter is external to a person making the assessments more susceptible to cultural, social, and environmental influences and somewhat less driven by inborn temperament. Culture-infused variables like values and beliefs/attitudes do have considerable heritability but lesser in comparison with personality traits (Bouchard, 2004), which might imply they are more malleable than personality traits, thus a bit more subject to cultural (environmental) influences

that can be viewed as relatively stable across time periods. In contrast, people tend to have more dynamic, immediate and comprehensive information about themselves, as compared to the outer world, making self-evaluations more variable across situations/time and subject to everyday life situations. Self-enhancement or self-protective mechanisms are also relatively more salient in the dynamic nature of personality assessments. Moreover, there could be a selective advantage to maintain opposing tendencies within a population, to balance the fitness capacity of each tendency (Buss, 2009) (e.g., while high *Neuroticism* may aid in evading dangers, low levels are crucial for providing stability in a society), rather than everyone becoming the same. The higher variance in Personality-CNI can therefore be viewed as a reflection of the additional variability introduced by a relatively greater influence of the individual's current psychological state, perceived implications of the assessment or the balance of selection pressures in a society. The lower variance observed in Mindset-CNI assessments could reflect the capacity of the psychological domains assessed to align individuals more closely with normative standards, or the individuals' motivation to maintain a higher degree of shared alignment with the broader population. Populations might also prioritize maintaining shared beliefs, as reflected in certain religious notions such as "When everyone believes X, the world will become a wonderful place." This is an important distinction that characterizes the cultural differentiation between societies. While Mindset attributes are more likely to draw a consensus, Personality traits are more likely to be distributed similarly across cultures. Lastly, cultures where people are less familiar with self-reporting personality or typically focus on situational rather than dispositional explanations for behavior, responses may be less reliable or more influenced by response biases. This unfamiliarity with the task can result in random responses or confusion among participants.

In summary, although there are typical trait profiles as well as typical values/worldview profiles, the typical trait profiles are in some cultural contexts less predictive of how any one individual will respond or be described. This underscores the potential significance of Mindset variables in assessing cultural normativity. The relatively low variability around the Mindset-CNI estimates implies a higher degree of cross-cultural consistency, also potentially indicating that these variables capture some important attribute at a fairly consistent level across cultures. The consistency across countries could also be indicative of validity (e.g., Levine et al., 2003) – extent to which the measure captures the theoretical construct or concept it purports to assess – of this measure for assessing culture-fit, ensuring more appropriate and meaningful inferences for Mindset -CNI. Moreover, given that the Asian countries indicated a greater variance in Personality-CNI as compared to European countries, it could be viewed as problematic to conceive of CNI based mainly or entirely on personality constructs. Further research is needed wherein a direct comparison can be made when the number of items assessing the two measures are similar. Having said that, the current study hints at Mindset- and perhaps Ism-CNI to indicate higher stability as compared to GLOBE- or Personality-CNI.

Shifting focus to the within-country variation in CNI estimates, Mindset-based-CNI displayed more pronounced variation compared to the Personality-based-CNI, which consistently ranked among the lowest. However, the lowest estimates were observed for GLOBE-CNI. The reference-shift item framing for GLOBE measure is perhaps the most distinctive from the other measures in the study, wherein the target of evaluation is what others in one's society think. Unlike traditional psychometric measures that focus on individuals' own attitudes or attributes, GLOBE items require participants to estimate the attitudes or attributes of their group (e.g., GLOBE measure - "In my society, people are generally very friendly"). The focus is on societal-

level cultural practices and values or beliefs about entities external to the individual that emphasize collective functioning over individual actions (e.g., Isms measure - “I believe in the superiority of my own ethnic group”, Fanaticism measure - “Every war is armed terrorism”). In fact, GLOBE-CNI can be viewed as a measure of emic ethnography (an insider’s perspective on their own culture) or what one perceives as shared in their society. In that sense this form of cultural reflection can reveal biases rooted in individual experiences, media portrayals, and stereotypes or generalizations about one’s own culture, potentially revealing disconnects between individual’s perception of societal norms and reality. One is required to estimate the norms of their society. This process is vulnerable to the same psychological mechanisms that drive pluralistic ignorance (Miller & McFarland, 1987) – not knowing how a plurality of people in your society actually think. The consistently low average estimates across countries indicated for GLOBE-CNI, could suggest a potential gap between reality and what a lot of people think.

The consistently low average GLOBE-CNI estimates across countries raise questions about the validity of reference-shift items—at least those on the GLOBE scale as people do not exhibit strong consensus about the characteristics of their society. In comparison, greater convergence is observed when individuals are asked to describe their personal tendencies or ways of thinking, as captured by Personality-based-CNI measures. This discrepancy may partly explain the comparatively weaker associations between GLOBE-CNI and other attributes as we will see in the next. From the perspective of the Distributed Model of Culture (DMC), which emphasizes that societies are internally heterogeneous in their cultural aspects, these findings are consistent with the idea that individuals hold diverse perceptions of their cultural environment. While people may assume their culture is homogenous, their characterizations of it often vary significantly. If the DMC framework were inaccurate, we would expect high CNI values across

the board—particularly for GLOBE’s referent-shift items—since such homogeneity would be obvious to all. The GLOBE-CNI thus sheds light on how effectively individuals’ perceptions of others converge with the collective perceptions of others. GLOBE-CNI might be an outlier here, not because it is tapping into peripheral aspects of culture, but because it’s measuring by another method (method effect). It is also possible that participants struggle to align their own values and beliefs about others into conformity with what is common in their society; they may overestimate or underestimate the prevalence of certain cultural norms within their society, based on their perception of what is socially acceptable or prevalent. This method of assessing culture-fit may be introducing bias, potentially driving the low CNI estimates and suggesting that the GLOBE measure is less compatible with the CNI framework for studying culture.

Apart from the item framing, differences in item content across CNI types may also have important implications for within-country variation and the interpretation of CNI values. For instance, the GLOBE-CNI captures cultural congruence with respect to broad thinking patterns about how societies function in the context of collective behaviors, values, and attitudes toward hierarchy, future planning, and social roles. These dimensions, while important, are less likely to evoke strong emotional or deeply personal responses, as they revolve around more neutral or normative social behaviors and practices. In contrast, Fanaticism and Isms measures, which consistently indicated higher CNI values, delve into more personal, potentially moralistic and polarizing ideological content. Items in these measures tap into deeply held beliefs, including extremely stated views on violence, religion, race, self-interest, and national loyalty, that can lead to more opposing views. These topics are inherently more divisive, as they engage core identity elements, moral beliefs, and social group distinctions.

This divergence in content has broader implications for how cultural cohesion is maintained. Ideologies, values, and norms act as cognitive frameworks through which individuals interpret their social environment and formulate prescriptive visions for how that environment should be structured (Denzau & North, 1994). Salience of these mindset attributes may reinforce cultural cohesion by elevating the significance of shared attitudes in maintaining order and functionality within the broader sociocultural environment. In other words, avoidance of divisiveness (or conflict) might lead to cohesion and produce key variables with skewed distributions, reflecting an organized skewing of responses that contrasts with randomness or unorganized heterogeneity. As a result, individuals may hold stronger, more entrenched positions on polarizing issues, leading to clearer alignments or misalignments with their country's aggregate ideological tendency. It is plausible that adherence to prescriptive norms aimed at endorsing one end of a dimension involving divisive or conflict-promoting beliefs serves as a mechanism for self-preservation and social stability within these cultures. Consequently, norms are likely to be skewed toward promoting consensus and minimizing conflict, with variables touching on such norms exhibiting statistically skewed distributions where most individuals endorse similar views. This cultural skewness could enhance CNI values by indicating higher sharedness in the way people think—the 'signal' of normativity becomes more evident against the 'noise' of varied responding, thereby reducing within-country variation. Alternatively, these divisive beliefs might yield more variance (less skew) in responses if individuals hold opposing views, resulting in attenuated CNI due to greater disagreement.

The degree of misalignment could vary depending on the content, with some cultural elements (e.g., whether it is acceptable to murder or use violence) being more consequential than others (e.g., whether meetings should be planned in advance or whether people plan for the

future). Furthermore, some item content (e.g., “Religion should play the most important role in civil affairs”) may invoke little need for explicit awareness of how other people think, particularly in societies where conflict has been systematically minimized (e.g., theocracies or deeply religious societies). This discussion underscores the importance of domain-specific cultural normativity, as it plays a significant role in reinforcing social cohesion through varying kinds and levels of shared attitudes and values. While some countries indicated greater variation in the average CNI estimates, some demonstrated a greater overlap generating a similar range of CNI values across types. A greater overlap in CNI estimates across types may indicate lesser differentiation in the way people demonstrate sharedness (e.g., USA). Similarly, a greater differentiation between CNI’s (e.g., Malaysia) could reflect the relative positioning of domains in which normativity is more meaningful to the society. There is perhaps a systematic difference in the way societies demonstrate cultural normativity that reflects their ability to differentiate topics that are more significant to their society. Malaysia followed by China could be viewed as emphasizing Isms-CNI — centered on materialism, spiritualism, religious beliefs and ethnic superiority, which are closely tied to individual identity— to be most important to their shared cultural thinking. Isms-CNI (i.e., belief-oriented normativity) perhaps has a more centripetal force (tending to converge within the cultural context) than Personality- or GLOBE-CNI, because in these latter domains there are more centrifugal (diversity-generating) forces at work.

Both within and between country variation in CNI estimates suggested that Mindset-CNI along with Isms- and Fanaticism-CNI are perhaps more stable and robust estimates of cultural normativity while GLOBE- and to some extent Personality-based-CNI are less suitable for studying cultural normativity. The differentiations in CNI types were further explored by

observing the predictive effects of mindset and personality attributes. The focus of this discussion is on the significant and striking effects observed across CNI types.

Largest effects and the most interesting findings were observed at the country-level. CNI indicated linear positive associations with personality traits such as *Resilience* and more commonly with *Extraversion* – Big Six dimensions that are also closely associated with the Big Two dimension, *Dynamism* (characterized by activity, potency, and ascendancy, reflecting an individual's energy and assertiveness). While the association with *Extraversion* was anticipated due to its substantial overlap with *Dynamism*, the connection with *Resilience* is particularly noteworthy; relatively stronger links between Personality-CNI and Resilience compared to other CNI types were observed. Alignment with normative culture, as captured through personality, may facilitate an understanding of how others within the environment think, feel, and behave, fostering hardiness. This hardiness might emerge through mechanisms such as adopting adaptive strategies from others or situating oneself advantageously based on exposure to the prevailing temperament within the culture. Future research could further explore these mechanisms underlying the associations between CNI and the assessed attributes. Furthermore, the negative linear country-level associations with GLOBE traits indicated that those who tended to disagree with GLOBE items in general, tended to have higher CNI potentially reflecting an awareness that 'people in my society generally don't have any clear tendencies one way or the other, but just differ a lot'. This finding further supports the notion of GLOBE content as inherently ambiguous and foggy, contributing to variability in individuals' understanding of how others in their society think. *Assertiveness* – a Mindset attribute which is also closely linked to *Dynamism* – revealed strong positive nonlinear associations with Fanaticism-, Mindset-, Isms-and Personality-CNI. Specifically, CNI values were highest at the extreme ends of societal

Assertiveness. Societies with moderate levels of Assertiveness tended to exhibit the lowest CNI, suggesting that individuals in these cultures may perceive their environment as favoring moderate expression of opinions. In contrast, at the highest and lowest levels of perceived societal *Assertiveness*, CNI may rise due to mechanisms such as the tendency to suppress contrasting personal opinions to maintain social harmony, or the active expression of dominant cultural beliefs, which fosters internalization and projection of group-aligned thinking.

The more striking country level effects involved the negative nonlinear predictive associations of *Agreeableness* and *Institutional Collectivism* – linked to the Big Two *Social Self-Regulation* (characterized by propriety, socialization, community, and solidarity, reflecting the tendency to conform with social norms and to exhibit self-control). *Agreeableness* demonstrated nonlinear country-level associations with Mindset-, Isms- and Fanaticism-CNI. Given that the latter two are strongly correlated with Mindset-CNI (see Figure 3), these trends indicate that convergence in ideological and extremist thinking with one's culture (Mindset-based-CNI), is likely to be highest at moderate levels of the country level propensity to accommodate others. Perhaps a strong adherence or nonadherence with respect to the culture's stance on religious and sociopolitical issues could mean either very low or very high levels of overall tolerance towards varying beliefs (see Figure 5). Low CNI is then associated with low *Agreeableness*, marked by nastiness characteristic of personality/mindset outliers, and high *Agreeableness*, marked by either a kind of 'pollyanna-like' naivete about what the norms are or extreme altruism, perceived as not 'normal' (they could so much better than normal that they are different from normal). Furthermore, *Institutional collectivism* (IC) indicated positive linear associations at the individual level but negative ones at the country level. Notably the nonlinear country level associations were negative, as was the case with *Agreeableness*. A greater emphasis on loyalty,

acceptance by group, group goals or group cohesion might lead to attention away from individual differences (high IC); so when this emphasis heightens either people are not used to surveys or the task of characterizing what people are like, or their discerning of individual differences is clouded somewhat and their sense of what is desirable or typical can be muted. Additionally, low priority for group concerns (low IC) could be indicative of isolation or seclusion from the society as indicated by low CNI.

In summary, focusing on the prominent effects, while the Big Two *Dynamism*-related constructs (*Resilience*, *Extraversion*, *societal Assertiveness*) indicated positive *SSR*-related ones (*Agreeableness*, *Institutional collectivism*) indicated negative linear or nonlinear country-level associations with CNI. These results suggest positive relations of *Dynamism*-related constructs and negative relations of *SSR*-related ones with CNI, especially at the above mean levels of these attributes⁸. At higher levels of *Dynamism*, individuals may become more attuned to and informed about the behaviors and attitudes of others due to increased social engagement. This heightened interaction can facilitate the internalization of cultural norms, fostering stronger conformity to the culture. Conversely, at higher levels of *SSR*, individuals' extreme accommodation of others or prioritization of group goals may lead to behaviors perceived as less typical, reflecting weaker alignment with the normative culture

Some other notable trends across associations shed light on the importance of certain type of variables for predicting and measuring CNI. Three other country-level attributes, beyond those mentioned above, also ranked amongst the strongest associations with CNI. *Conscientiousness* revealed positive linear associations with Isms-CNI and nonlinear ones with Mindset-CNI, and

⁸ Although R^2 would offer a more robust comparison between the linear and nonlinear models, a shared feature of positive (or negative) associations across these models lies in the portion of the relationship observed at the higher end (here, above the mean as the variables are mean centered).

negative nonlinear ones with Personality6-CNI. *Future orientation* indicated negative linear associations with Personality-based-CNI and nonlinear positive associations with Fanaticism-CNI. *Originality* demonstrated a negative association with GLOBE-CNI. The inclusion of the two personality traits (*Conscientiousness*, *Originality*) and a GLOBE mindset attribute (*Future orientation*) further supports the importance of these constructs for predicting CNI. Furthermore, the inclusion of ten *Disintegration* items (a 40% increase after the Big Six items) to measure Personality7-CNI may have enhanced the robustness of Personality-CNI, resulting in the highest frequency of strong associations observed with personality and mindset attributes. This outcome could reflect a meaningful contribution of the *Disintegration* items to Personality-CNI or, alternatively, it may simply be a consequence of the additional items reducing the impact of missing data on the results.

Some attributes on the other hand failed to indicate relations with CNI overall. Amongst those were *Failed state perception* (FSP) and *Fanaticism* attributes which predicted CNI weakly at best. FSPs are less stable across time; for instance, when a preferred political faction is out of power, people might tend to see their country as a failed state, but when the faction gets in power again the opinions reverse. This is also likely to be true for fanaticism (as in ‘radicalization’) which can also change rapidly over time, highly dependent on the current state of affairs within a society. Thus, there is no reason to expect that an individual’s (or society’s) cultural normativity will change rapidly in short time spans. CNI is also weakly associated with tendency for psychopathological thinking related to dissociative experiences, paranoid ideation, cognitive distortions or emotional dysregulation (*Disintegration*). Deviations from the culturally normative do not reflect pathological deviation in thought. These weak effects with CNI’s underscore the

need for multifaceted approaches in studying extremist beliefs and psychopathological experiences.

In case of SWB, it was at best a weak predictor of CNI. Furthermore, when the roles were reversed and CNI was assessed for its predictive capacity of SWB, the overall effects were positive with strongest associations observed for cultural alignment with worldviews (Isms-), overall beliefs, values and ideological thinking (Mindset-) and overall temperament including aspects of psychopathology (Personality7-CNI). Significant linear effects were also observed for these CNI, supporting positive relations between these CNI types and SWB at higher levels of CNI. While past research has supported the predictive role of CNI for SWB (e.g., Weston et al., 2024), no prior study, has studied this relationship with broad cross-culture samples that put great emphasis on happiness, as well as those that don't.

This study demonstrated that culture-fit, or cultural normativity, can be assessed in a domain-specific manner and results depend somewhat on what specific domain of cultural contents is involved. It would be therefore worthwhile to explore how CNI functions across other psychological domains similar to and beyond those measured here. Also, this study demonstrated that a variety of attributes – including personality *Agreeableness* and perceptions of society-wide *Institutional Collectivism* and *Assertiveness* – have intriguing associations with cultural normativity. Assessing a broader range of attributes as predictors of CNI—beyond the Big Six personality traits and the mindset traits utilized in this research—could yield additional insights. Of special interest would be an exploration of whether the greater variability in Personality-based-CNI vs. Mindset-based-CNI and the CNI-Big Two links replicate in future studies with CNI, especially with larger and more cross-cultural samples. Moreover, achieving a more comprehensive worldwide representation of cultures would allow us to validate the results

observed. It would also be interesting. Study 2 aims at addressing these considerations by expanding the scope of psychological domains examined, incorporating additional predictor attributes, and including a more globally representative sample to enhance the validity and generalizability of these findings.

CHAPTER IV: STUDY 2

Results

RQ 1: How to quantify CNI?

Eight types of CNI were derived from the Mindset and Personality measures. In addition to the comprehensive Mindset-CNI, eight domain-specific CNIs were identified: Isms, GLOBE, GLOBE-Extra, Fanaticism, Moral Foundations, and Social Axioms. Each of these domain-specific CNIs focus on a distinct facet of the mindset construct, providing a nuanced understanding of how different aspects of mindset are conceptualized to map culture.

Similar to Study 1, this study also computed Isms-, GLOBE- and Fanaticism-CNI. While the former consisted of lesser number of items, the latter two consisted of more number of items in comparison to Study 1. Moreover, Mindset-CNI additionally comprised of Extra GLOBE items (measuring Regulatory Norm behaviors)– developed for assessing domains similar to those in the original GLOBE measure, Moral Foundations items, Social Axioms items– alongwith items measuring *Machiavellianism*, *Ethnonationalism*, *Civic Multicultural Nationalism*, participation in Religious Activities and Values. Caution must be exercised when making direct comparisons in the effects observed across studies with respect to these CNIs as the content as and the number of items are likely to differ.

First, some description of variables not included in Study 1. Moral Foundations are described as innate psychological structures that underpin human moral reasoning (Graham et al., 2013). The original motivation for proposing this theory and developing its measurement items was to ensure that responses would correlate strongly with political party affiliation (e.g., Graham et al., 2009). As such, the proposed foundations can be understood as values that are differentially moralized by opposing political groups. Five moral foundations were proposed

including, *Care/Harm* (compassion, empathy, and the desire to alleviate pain), *Fairness/Reciprocity* (justice, rights, and equality), *Ingroup/Loyalty* (loyalty, patriotism, and self-sacrifice for the group), *Authority/Respect* (social order, hierarchy, and rule-following), *Purity/Sanctity* (notions of chastity, temperance, and the pursuit of elevated, noble ideals).

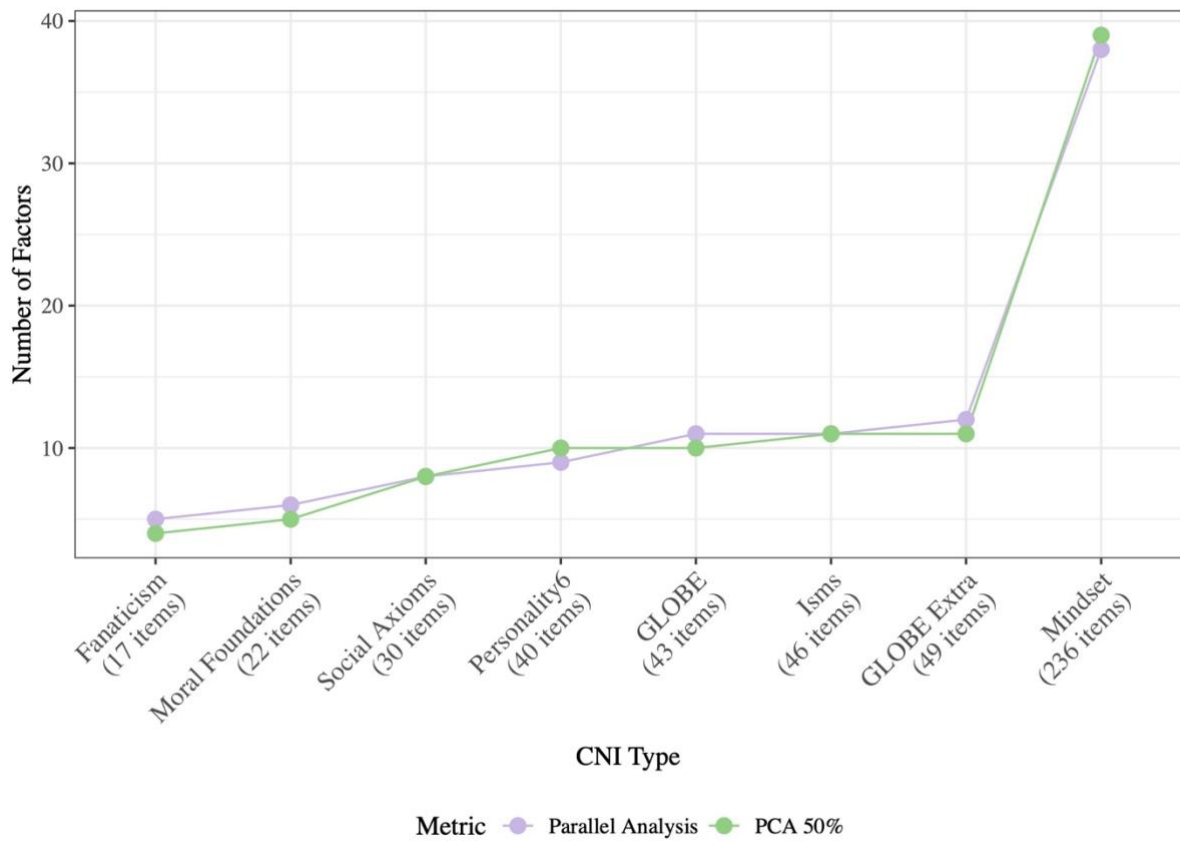
Social axioms are generalized beliefs about the world and can be seen as worldviews. They encompass ideas about people, social institutions, and various phenomena, whether they stem from the physical, spiritual, or social domains (Stankov & Saucier, 2015). The current measure encompasses five domains: *Social Cynicism* (people are selfish, dishonest, and that societal systems are corrupt), *Reward for Application* (effort, knowledge, and careful planning lead to positive outcomes), *Social Complexity* (intricate, dynamic and multifaceted nature of human behavior and social events), *Fate Control* (life events are mainly predetermined by external forces but can be influenced through actions or rituals) and *Religiosity* (existence and importance of a higher power or spiritual forces).

Unlike Study 1, only one Personality-based-CNI was computed – Personality6-CNI⁹ comprising of the Big Six dimensions of personality (Thalmayer & Saucier, 2014). Also, complexity metrics suggested Mindset to be the most heterogeneous in comparison with other CNI types - Fanaticism and Moral Foundations-CNI (Figure 7). All CNI estimates indicated moderate to strong positive correlations (Figure 8). Isms- and Fanaticism-CNI estimates demonstrated a strong association ($r = .81$), while Mindset-CNI indicated the strongest association with Isms-CNI ($r = .71$). Lowest associations were observed between SocAx-CNI and both Mf-CNI ($r = .32$) and Personality6-CNI ($r = .32$).

⁹ Study 2 data did not measure *Disintegration* which was included in the Personality7-CNI measured in Study 1.

Figure 7

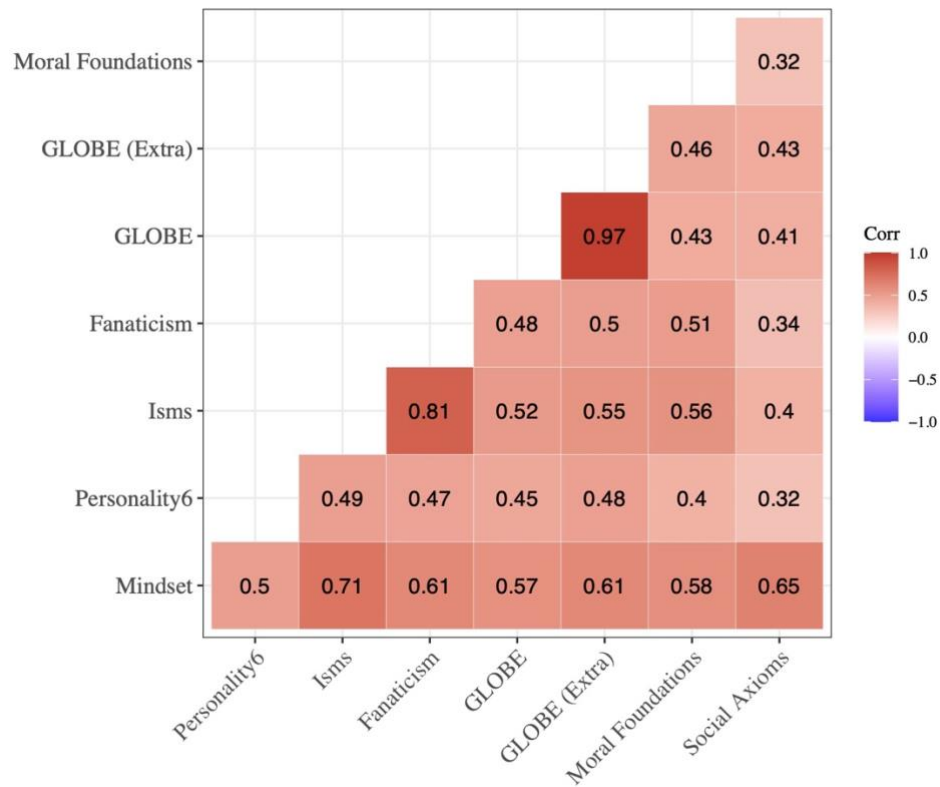
Model Complexity Measures Across CNI Models



The average CNI estimate (Table 4.1) after controlling for the overall mean profile was the highest for Mindset-CNI ($b = 0.59$, 95% CI [0.57, 0.61], $p < .001$), followed by Fanaticism-CNI ($b = 0.58$, 95% CI [0.55, 0.62], $p < .001$) and Social Axioms-CNI ($b = 0.54$, 95% CI [0.51, 0.57], $p < .001$). Moral foundations-CNI generated the smallest mean estimate ($b = 0.46$, 95% CI [0.41, 0.51], $p < .001$). Personality6-CNI indicated an average value just above Moral-foundations-CNI ($b = 0.50$; 95% CI [0.44, 0.55], $p < .001$). Estimated standard deviation of CNI's (random slopes) across participants ($\hat{\sigma}_{ID}$) and country ($\hat{\sigma}_{country}$) ranged across values of .17 to .22 and .06 to .12 respectively.

Figure 8

Correlations Between CNI Types



The highest degree of variability was observed for MF-CNI (CI range = 0.09), followed by Fanaticism-CNI (CI range = 0.07), as indicated by their wider confidence intervals. In contrast, Mindset-CNI (CI range = 0.04) and Isms-CNI (CI range = 0.05) demonstrated substantially lower variability, reflected in their narrower confidence intervals. Notably, while the highest variability in Study 1 was observed for Personality-based-CNI, the CNIs with the lowest variability remained consistent across both studies. Furthermore in Study 2, while MF- and GLOBE-CNI competed for the lowest average CNI estimates, Fanaticism- and SocAx-CNI competed for the highest average CNI estimates across countries (Figure 9).

Table 4.1

Mindset and Personality Cultural Normativity Index (CNI) Models

	Mindset						Personality	
	Mindset	Ism	GLOBE	GLOBE (Extra)	Fanaticism	Moral Foundations	Social Axioms	Big 6
CNI	0.59*** [0.57, 0.61]	0.52*** [0.50, 0.55]	0.47*** [0.44, 0.50]	0.50*** [0.47, 0.53]	0.58*** [0.55, 0.62]	0.46*** [0.41, 0.51]	0.54*** [0.51, 0.57]	0.50*** [0.47, 0.53]
Multi Country Average Profile	0.02*** [0.02, 0.02]	0.00 [-0.01, 0.01]	0.02*** [0.01, 0.03]	0.02*** [0.01, 0.03]	-0.00 [-0.02, 0.02]	0.05*** [0.03, 0.07]	0.01 [-0.01, 0.02]	0.01 [-0.01, 0.02]
SD CNI (across people)	0.17	0.21	0.2	0.21	0.22	0.22	0.2	0.19
SD CNI (across country)	0.06	0.07	0.08	0.09	0.09	0.12	0.09	0.07
SD (Observations)	0.78	0.81	0.84	0.83	0.76	0.83	0.8	0.83
Num.Obs.	1902174	366706	342327	390263	135601	176090	251055	321388

Note:(***) $p < 0.001$, (no stars) $p \geq 0.1$; From reference to Model 1, CNI = random effect (μ_{10c}), Multi Country Average Profile = fixed effect (β_{2pc}), SD CNI = Level 2 residual variance, SD CNI (across country) = Level 3 residual variance, SD (Observations) = Level 1 residual variance.

Overall, average Personality-CNI estimates were lower than Mindset-CNI estimates, similar to Study 1, except for countries including Phillipines, Kenya, Mexico, Tanzania and Ethiopia where they had overlapping confidence intervals. Brazil, Germany and Poland produced the highest while Tanzania, Ethiopia and Morocco produced the lowest CNI estimates. Malaysia followed by Morocco reported greater variability across types of average CNI estimates in comparison to other countries. For Mindset-CNI, Brazil showed the highest average estimates and Morocco the lowest, which also correspond to the overall country rankings for highest and lowest CNI estimates. A greater overlap in confidence intervals across CNI was observed for USA and Argentina in contrast with a high variation in countries such as Malaysia, Morocco, Ethiopia and Tanzania.

At the person level, CNI estimates showed the widest range of 1.41 for GLOBE-Extra-CNI (-.58 to .83) and the narrowest range of 1.09 for Moral Foundations-CNI (-.29 to .80). Mindset-CNI showed a range of 1.33 (-0.48 to 0.86), slightly higher than Personality-CNI, which had a range of 1.27 (-0.49 to 0.78); this trend was similar to the findings in Study 1.

RQ2: What person and community characteristics are associated with CNI?

A greater number of individual and community-level mindset ($n = 49$) and personality ($n = 8$) variables were tested as linear and quadratic predictors for each CNI type, as compared to Study 1. The continuous predictor variables were mean-centered to facilitate interpretation of the results. Notably, the overall range of effect sizes were higher in Study 2 as compared to Study 1 across linear and quadratic effects, and individual and country-levels. Effect sizes were smaller at the individual-level, while at the country-level larger effects for quadratic ($range =$

1.80, $min = -0.65$, $max = 1.15$) as compared to linear ($range = 0.35$, $min = -0.14$, $max = 0.21$) effects were observed. Similar to Study 1, the results are outlined employing Model-focused and Trait-focused views. Notable effects beyond this subset of effects are also discussed. All tables and figures describing linear and quadratic effects across all CNI's are available in the supplemental material.

Model-Focused View

At the individual-level, the *Big Two* (*SSR* and *Dynamism*) indicated the strongest linear (Table 4.2) and quadratic (Table 4.3) associations with Personality6-CNI. Additionally, positive and relatively strong linear associations with other Mindset-based-CNI were also observed for *SSR* (with Fanaticism-, Isms-, GLOBE-Extra-, Mindset-, GLOBE- and MF-CNI) and *Dynamism* (GLOBE-Extra-, Fanaticism-, MF- and GLOBE -CNI). Interestingly, *SSR* was negatively, nonlinearly associated with Personality-CNI; all the other Big Two-CNI associations followed the same direction as in the case of linear associations. Overall, the quadratic associations were closer to zero, similar to Study 1.

Individual level linear associations also indicated that Mindset-CNI had presumably lower magnitudes of Big Two associations than the Fanaticism- and Isms-CNI because Mindset-CNI is also taking in other measures like MF- and Social-Axioms-CNI that have weaker linear associations. As discussed previously in Study 1, the method match effect – higher effect magnitude observed when the CNI domain matches that of the predictor – was also observed for Fairness and MF-CNI link apart from the those within the personality domain (e.g., Big Two and Personality-based-CNI link).

Figure 9

CNI Estimates Across Countries: Eight CNIs



Note: Error bars indicate confidence intervals.

Overall, strong linear effects with CNI were marked by the predictive association between the *Big Two* (*SSR and Dynamism*) and *Honesty* personality traits and mindset attributes — *Civic Multicultural Nationalism, Fairness, Proneness to Aggression, Organizational Religious Activity, Inequality Aversion, Self-Transcendence* — and Personality6-, Fanaticism-, Isms-, GLOBE-, GLOBE Extra- and MF-CNI as criterion variables. Strong quadratic effects were characterized by *Big Two* personality traits and mindset traits — *Organizational Religious Activity* and *Self-Transcendence* with the same criterion variables as the linear effects, except for the inclusion of SocAx-CNI.

At the country-level as well, the *Big Two* indicated strong associations with CNI. *Dynamism* indicated a relatively strong predictive linear association with Fanaticism- followed by MF-CNI (Table 4.4), while the strongest quadratic effect — which was also the overall largest effect observed in this study — was with MF-CNI with a notably large effect size (Table 4.5). *Dynamism* also indicated positive linear associations with GLOBE Extra-, Personality6-, Mindset-CNI and quadratic associations with GLOBE-Extra-, Fanaticism-, GLOBE-, Isms-, Social Axioms-, and Mindset-CNI. Interestingly, *SSR* indicated negative linear and quadratic associations with MF-CNI, and negative quadratic associations with GLOBE Extra-, Fanaticism- and GLOBE-CNI; this pattern violated the trends observed at the individual level. A noteworthy observation was that Study 2 revealed larger quadratic effects at the country level compared to Study 1. This difference may stem from the broader sample in Study 2 (27 countries vs. 8 in Study 1), reducing the influence of noise tendencies that might emerge in smaller datasets during quadratic analyses. Also noteworthy was the finding that the *Big Two* traits indicated larger effects in comparison with *Big Six* in Study 2.

Beyond the Big Two, linear associations were also found with personality trait *Extraversion*, and mindset attributes including *Organizational* and *Non-organizational Religious Activity*, *Conservation*, *Assertiveness*, *Purity*, *Self Enhancement*, *Authority*, *Self-Transcendence* and *Proneness to Aggression*; although these effects were small (closer to zero). Other quadratic associations were characterized by mindset traits such as *Openness to Change* and *Self-Transcendence* which indicated relatively substantial effects (>0.1) with CNI.

Trait-Focused Approach

An examination of the twenty strongest moderator effects (Table 4.6)¹⁰ revealed significant associations with the *Big 2* personality dimensions, and the mindset trait *Openness to Change*, predominantly at the country-level, with both non-linear and linear relationships observed across various CNI types. *Dynamism* emerged as a particularly influential moderator, showing strong quadratic associations with MF-, GLOBE-Extra-, Fanaticism-, GLOBE-, Isms-, SocAx-, Mindset- and Personality6-CNI. *SSR* exhibited notable influence as a predictor with MF-, GLOBE-Extra-, Fanaticism-, GLOBE-, Personality6-, and Mindset -CNI. Interestingly, while *Dynamism* appears to share positive associations with both Personality- and Mindset-based-CNI, *SSR* indicates positive associations with Personality- but negative ones with Mindset-based-CNI. Most Mindset-based-CNI associations with *SSR* were negative, quadratic associations at the country level; this implies that the moderating effect is strongest near the overall mean score on country-level *SSR* (since *SSR* was mean centered) and gets weaker at both extremes (high or low values of the *SSR*), creating a symmetrical inverted-U shape centered at the mean (see Figure 10). For *Dynamism* an upward looking U-shape is more

¹⁰ As previously noted in Study 1, this table presents the key traits that exhibit a predictive association with CNI. No inferences are drawn about comparison between linear and quadratic associations seen here. To address the potential issue of comparing disparate measures (apples vs. oranges), it is recommended to compute marginal R^2 values, which indicate the variance explained by both fixed and random effects within the model.

characteristic of the positive associations observed, wherein the CNI is the highest at the extremes. In addition to the Big Two, *Openness to Change* (from Schwartz's values), also showed positive nonlinear associations with MF-and SocAx-CNI, however these effects were relatively small ($b^2 < .15$).

Table 4.2

Study 2: Strongest Linear Associations With CNI at the Individual-Level

CNI type	Moderator trait	Est	95% CI
Personality6	Social Self-Regulation*	0.254	[0.246, 0.262]
Personality6	Dynamism*	0.159	[0.149, 0.169]
Fanaticism	Social Self-Regulation*	0.068	[0.06, 0.077]
Isms	Social Self-Regulation*	0.054	[0.047, 0.06]
GLOBE-Extra	Social Self-Regulation*	0.045	[0.038, 0.053]
Isms	Civic Multicultural Nationalism†	0.043	[0.041, 0.046]
Mindset	Social Self-Regulation*	0.043	[0.039, 0.047]
Fanaticism	Civic Multicultural Nationalism†	0.043	[0.04, 0.046]
GLOBE	Social Self-Regulation*	0.040	[0.033, 0.047]
GLOBE-Extra	Dynamism*	0.039	[0.032, 0.047]
Moral Foundations	Social Self-Regulation*	0.039	[0.031, 0.047]
Moral Foundations	Fairness†	0.037	[0.035, 0.039]
Fanaticism	Dynamism*	0.033	[0.024, 0.043]
Fanaticism	Prone to Aggression†	-0.033	[-0.035, -0.031]
Personality6	Honesty*	0.033	[0.032, 0.034]
Moral Foundations	Dynamism*	0.033	[0.024, 0.042]
Moral Foundations	Organizational Religious Activity†	-0.032	[-0.036, -0.029]
Isms	Inequality Aversion†	0.032	[0.031, 0.033]
GLOBE	Dynamism*	0.032	[0.024, 0.039]
Fanaticism	Self-Transcendence†	0.031	[0.028, 0.035]

Note: * Personality trait † Mindset trait. Twenty highest absolute effect sizes ($Est = \beta_{1t}\mu_{11}$; interaction effect from Model 3.1) are reported for significant ($p < .001$) associations.

A graphical representation of the five highest predictive effects within each CNI (Figure 11) provide some interesting insights. While the associations weigh either on positive or negative sides for a trait for *Dynamism*, *Openness to Change* and *Self-Transcendence*, a

notable departure from this trend is seen for *SSR*. While most Mindset-based CNI are negatively predicted by *SSR*, Personality6-CNI indicates a positive linear association at both the individual and country levels.

Table 4.3

Study 2: Strongest Quadratic Associations With CNI at the Individual-Level

CNI type	Moderator trait	Est	95% CI
Personality6	Social Self-Regulation*	-0.076	[-0.085, -0.066]
Fanaticism	Social Self-Regulation*	0.034	[0.03, 0.039]
Isms	Social Self-Regulation*	0.026	[0.022, 0.03]
Mindset	Social Self-Regulation*	0.025	[0.023, 0.028]
Fanaticism	Dynamism*	0.024	[0.018, 0.03]
Social Axioms	Social Self-Regulation*	0.024	[0.02, 0.027]
Social Axioms	Dynamism*	0.022	[0.018, 0.027]
Moral Foundations	Dynamism*	0.021	[0.015, 0.026]
GLOBE-Extra	Dynamism*	0.020	[0.015, 0.025]
GLOBE	Dynamism*	0.019	[0.014, 0.023]
Isms	Dynamism*	0.018	[0.013, 0.023]
Mindset	Dynamism*	0.017	[0.014, 0.02]
GLOBE	Social Self-Regulation*	0.015	[0.011, 0.019]
Moral Foundations	Social Self-Regulation*	0.015	[0.01, 0.019]
GLOBE-Extra	Social Self-Regulation*	0.014	[0.01, 0.018]
Moral Foundations	Organizational Religious Activity†	-0.009	[-0.011, -0.007]
Fanaticism	Self-Transcendence†	0.007	[0.006, 0.008]
Isms	Non-organizational Religious Activity†	0.006	[0.005, 0.008]
Isms	Self-Transcendence†	0.006	[0.005, 0.007]
Social Axioms	Self-Transcendence†	0.005	[0.005, 0.006]

Note: * Personality trait † Mindset trait. Twenty highest absolute effect sizes (Est = $\beta_{1t}\mu_{12}^2$) interaction effect from Model 3.2) are reported for significant ($p < .001$) associations.

RQ3: What person characteristics such as age, SES and location type (urban vs. rural) predict CNI?

Having assessed specific personality and mindset characteristics, associations between person related demographics (sex, age, mother's education, father's education and family

home) and CNI are explored. For each type of CNI, demographic characteristics were included as covariates to predict random slopes (i.e., CNI for each individual).

Table 4.4

Study 2: Strongest Linear Associations With CNI at the Country-Level

CNI type	Moderator trait	Est	95% CI
Fanaticism	Dynamism*	0.206	[0.173, 0.24]
Moral Foundations	Dynamism*	0.165	[0.131, 0.198]
Moral Foundations	Social Self-Regulation*	-0.144	[-0.176, -0.112]
GLOBE-Extra	Dynamism*	0.127	[0.099, 0.155]
Personality6	Dynamism*	0.119	[0.093, 0.146]
Personality6	Social Self-Regulation*	0.102	[0.076, 0.127]
Moral Foundations	Organizational Religious Activity†	-0.096	[-0.102, -0.089]
Moral Foundations	Non-organizational Religious Activity†	-0.090	[-0.096, -0.085]
Moral Foundations	Self Enhancement†	-0.090	[-0.103, -0.076]
Moral Foundations	Conservation†	-0.088	[-0.094, -0.081]
Mindset	Dynamism*	0.079	[0.059, 0.099]
Moral Foundations	Assertiveness†	0.067	[0.059, 0.074]
GLOBE-Extra	Organizational Religious Activity†	-0.063	[-0.069, -0.058]
Moral Foundations	Extraversion*	0.062	[0.058, 0.067]
Moral Foundations	Purity†	-0.059	[-0.064, -0.053]
GLOBE-Extra	Self Enhancement†	-0.058	[-0.069, -0.047]
Moral Foundations	Authority†	-0.057	[-0.061, -0.053]
Fanaticism	Self Enhancement†	-0.057	[-0.071, -0.043]
Fanaticism	Self-Transcendence†	0.056	[0.043, 0.069]
Moral Foundations	Prone to Aggression†	-0.056	[-0.062, -0.05]

Note: * Personality trait † Mindset trait. Twenty highest absolute effect sizes ($Est = \beta_{1t}\mu_{11}$; interaction effect from Model 3.1) are reported for significant ($p < .001$) associations.

Place of Family Home

Across CNIs, *Place of Family Home* (PoFH) revealed consistently significant associations with all CNI's – SocAx-CNI ($\chi^2(3) = 34.67, p < .001$), Mindset-CNI ($\chi^2(3) = 16.42, p < .001$), MF-CNI ($\chi^2(3) = 15.01, p < .01$), Isms-CNI ($\chi^2(3) = 14.72, p < .01$),

Personality6-CNI ($\chi^2(3) = 10.05, p < .05$), Fanaticism-CNI ($\chi^2(3) = 9.14, p < .05$), GLOBE Extra-CNI ($\chi^2(3) = 8.44, p < .05$), – except GLOBE-CNI ($\chi^2(3) = 2.70, p > .05$).

Table 4.5

Study 2: Strongest Quadratic Associations With CNI at the Country-Level

CNI type	Moderator trait	Est	95% CI
Moral Foundations	Dynamism*	1.154	[1.026, 1.282]
Moral Foundations	Social Self-Regulation*	-0.650	[-0.784, -0.516]
GLOBE-Extra	Social Self-Regulation*	-0.605	[-0.716, -0.494]
GLOBE-Extra	Dynamism*	0.524	[0.417, 0.631]
Fanaticism	Social Self-Regulation*	-0.461	[-0.596, -0.327]
GLOBE	Social Self-Regulation*	-0.400	[-0.511, -0.288]
Fanaticism	Dynamism*	0.279	[0.15, 0.408]
GLOBE	Dynamism*	0.264	[0.156, 0.373]
Isms	Dynamism*	0.241	[0.135, 0.348]
Mindset	Social Self-Regulation*	-0.230	[-0.31, -0.151]
Social Axioms	Dynamism*	0.206	[0.098, 0.315]
Mindset	Dynamism*	0.174	[0.097, 0.251]
Moral Foundations	Openness to Change†	0.149	[0.126, 0.171]
Social Axioms	Openness to Change†	0.136	[0.118, 0.155]
GLOBE	Openness to Change†	0.111	[0.092, 0.13]
Isms	Openness to Change†	0.111	[0.092, 0.129]
GLOBE-Extra	Openness to Change†	0.105	[0.086, 0.124]
Moral Foundations	Self-Transcendence†	0.102	[0.084, 0.119]
Personality6	Openness to Change†	0.098	[0.079, 0.116]
Mindset	Openness to Change†	0.089	[0.075, 0.102]

Note: * Personality trait † Mindset trait. Twenty highest absolute effect sizes ($Est = \beta_{1t}\mu_{12}^2$; interaction effect from Model 3.2) are reported for significant ($p < .001$) associations.

A common trend across most CNI types – including Mindset-, Isms-, GLOBE Extra-, SocAx- and Personality6-CNI, indicated higher CNI scores among individuals from rural areas and small towns compared to those from medium-sized and large cities (Figure 12). Interestingly, some CNI's – Fanaticism-, GLOBE- and MF-CNI – on the other hand indicate higher CNI scores for small town or village but lower scores for rural area as compared to large and

medium-sized cities. A potential reason is the lack of familiarity or understanding of instructions for survey responses from rural areas that could have led to some level of random responding, but this possibility is rather speculative.

Table 4.6

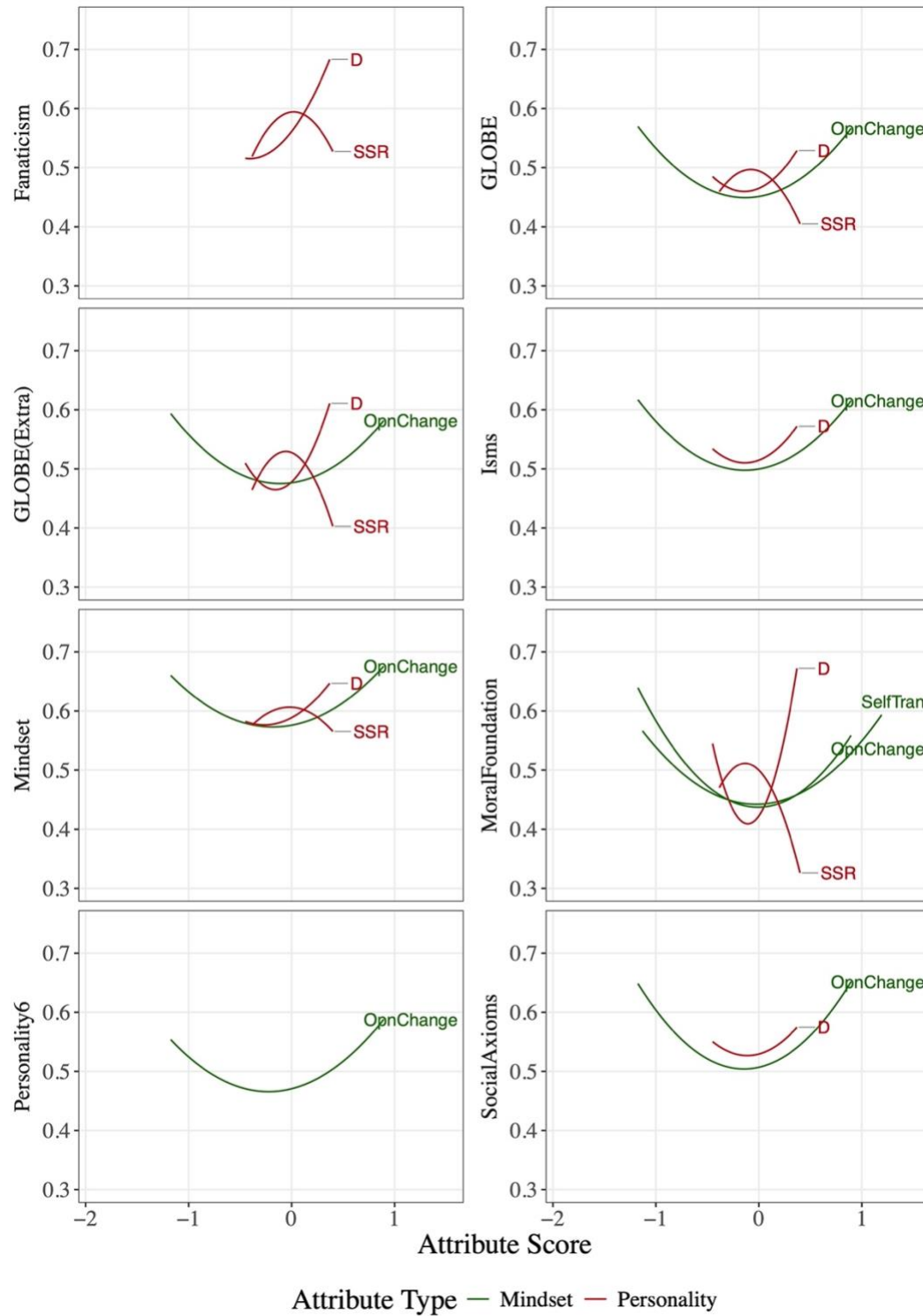
Highest Effect Sizes Across Mindset and Personality Attributes Across CNI Types

CNI type	Trait	Term	Est	95% CI
Moral Foundations	Dynamism (Personality)*	(b^2)	1.154	[1.026, 1.282]
Moral Foundations	Social Self-Regulation (Personality)*	(b^2)	-0.650	[-0.784, -0.516]
GLOBE-Extra	Social Self-Regulation (Personality)*	(b^2)	-0.605	[-0.716, -0.494]
GLOBE-Extra	Dynamism (Personality)*	(b^2)	0.524	[0.417, 0.631]
Fanaticism	Social Self-Regulation (Personality)*	(b^2)	-0.461	[-0.596, -0.327]
GLOBE	Social Self-Regulation (Personality)*	(b^2)	-0.400	[-0.511, -0.288]
Fanaticism	Dynamism (Personality)*	(b^2)	0.279	[0.15, 0.408]
GLOBE	Dynamism (Personality)*	(b^2)	0.264	[0.156, 0.373]
Personality6	Social Self-Regulation (Personality)†	(b)	0.254	[0.246, 0.262]
Isms	Dynamism (Personality)*	(b^2)	0.241	[0.135, 0.348]
Mindset	Social Self-Regulation (Personality)*	(b^2)	-0.230	[-0.31, -0.151]
Social Axioms	Dynamism (Personality)*	(b^2)	0.206	[0.098, 0.315]
Fanaticism	Dynamism (Personality)*	(b)	0.206	[0.173, 0.24]
Mindset	Dynamism (Personality)*	(b^2)	0.174	[0.097, 0.251]
Moral Foundations	Dynamism (Personality)*	(b)	0.165	[0.131, 0.198]
Personality 6	Dynamism (Personality)†	(b)	0.159	[0.149, 0.169]
Moral Foundations	Openness to Change (Mindset)*	(b^2)	0.149	[0.126, 0.171]
Moral Foundations	Social Self-Regulation (Personality)*	(b)	-0.144	[-0.176, -0.112]
Social Axioms	Openness to Change (Mindset)*	(b^2)	0.136	[0.118, 0.155]
GLOBE-Extra	Dynamism (Personality)*	(b)	0.127	[0.099, 0.155]

Note: (b) = interaction effect ($\beta_{1t}\mu_{11}$) in the Linear Model 3.1, (b^2) = interaction effect ($\beta_{1t}\mu_{12}^2$) in the Quadratic Model 3.2; Country-level*, Individual-level†; all effects are significant at $p < .001$

Figure 10

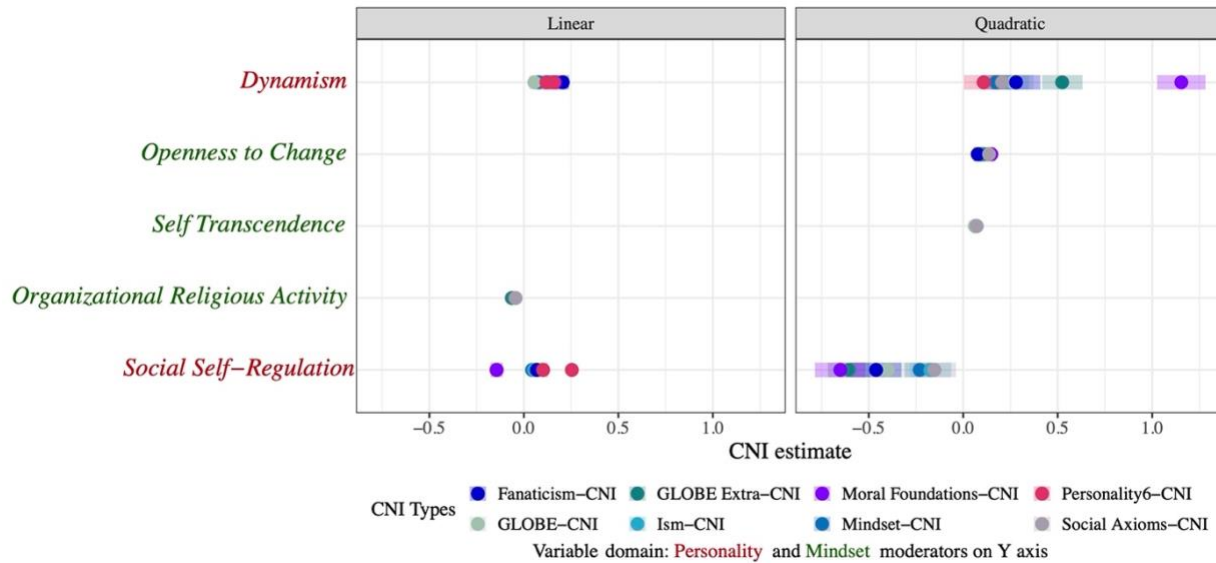
Study 2: Twenty Highest Nonlinear Country-Level Associations With CNI



Note: D = Dynamism, SSR = Social Self-Regulation, OpnChange = Openness to Change, SelfTran = Self-Transcendence; CNI type on the Y-axis.

Figure 11

Study 2: Five Strongest Estimates Across CNI Types



Mother's Education

Across CNI's, Mother's Education showed consistently significant positive associations – Mindset-CNI ($\chi^2(8) = 30.50, p < .001$), Personality6-CNI ($\chi^2(8) = 23.71, p < .01$), Fanaticism-CNI ($\chi^2(8) = 32.67, p < .001$), GLOBE-CNI ($\chi^2(8) = 46.04, p < .001$), GLOBE-Extra-CNI ($\chi^2(8) = 69.55, p < .001$), MF-CNI ($\chi^2(8) = 90.30, p < .001$), SocAx-CNI ($\chi^2(8) = 62.27, p < .001$) – except Isms-CNI ($\chi^2(8) = 6.67, p > .05$)¹¹.

The common trends involved higher effect sizes when mother's education involved attending some graduate school or obtaining a professional degree (Figure 13). The exceptions to this trend involved MF-CNI wherein large effects were observed for those whose mothers reportedly had an associate's or 2-year college degree and those whose mothers' attended business or trade school. Notably for Personality6-CNI, larger CNI effects were observed for

¹¹ Due to computational limitations with car::Anova when using the F statistic for model comparison χ^2 tests were used instead to compare null and alternative models for each predictor/moderator in the CNI analyses.

those with mother's who not only attended some graduate school or obtained a professional degree but also those who had a bachelor's degree or 4-year college degree or attended some college. These patterns overall support that higher maternal education may facilitate greater alignment with cultural norms. Overall largest effect sizes were observed for Mindset-based-CNI. Personality6-CNI, indicated higher CNI scores among individuals from rural areas and small towns compared to those from medium-sized and large cities.

Father's Education

Father's Education indicated significant associations all CNIs – Mindset-CNI ($\chi^2(8) = 46.84, p < .001$), Personality6-CNI ($\chi^2(8) = 36.07, p < .001$), Isms-CNI ($\chi^2(8) = 27.17, p < .001$), Fanaticism-CNI ($\chi^2(8) = 25.57, p < .05$), GLOBE-CNI ($\chi^2(8) = 74.41, p < .001$), GLOBE Extra-CNI ($\chi^2(8) = 87.60, p < .001$), MF-CNI ($\chi^2(8) = 101.84, p < .001$), SocAx-CNI ($\chi^2(8) = 49.81, p < .001$). Across Mindset-based-CNI types, CNI scores indicated greater values when paternal education involved attending a business or trade school, have a bachelor's or 4-year college degree and in some cases also graduate or professional degrees (Figure 14). In case of Personality6-CNI equally large effect sizes were observed across varying levels of paternal education including bachelor's or 4-year college degree, attending business or trade school, or some college, or some high school, or some graduate school or have obtained a professional degree. Similar to Mother's education, overall largest effect sizes were observed for Mindset-based-CNI.

Figure 12

Estimated CNI by Family Home

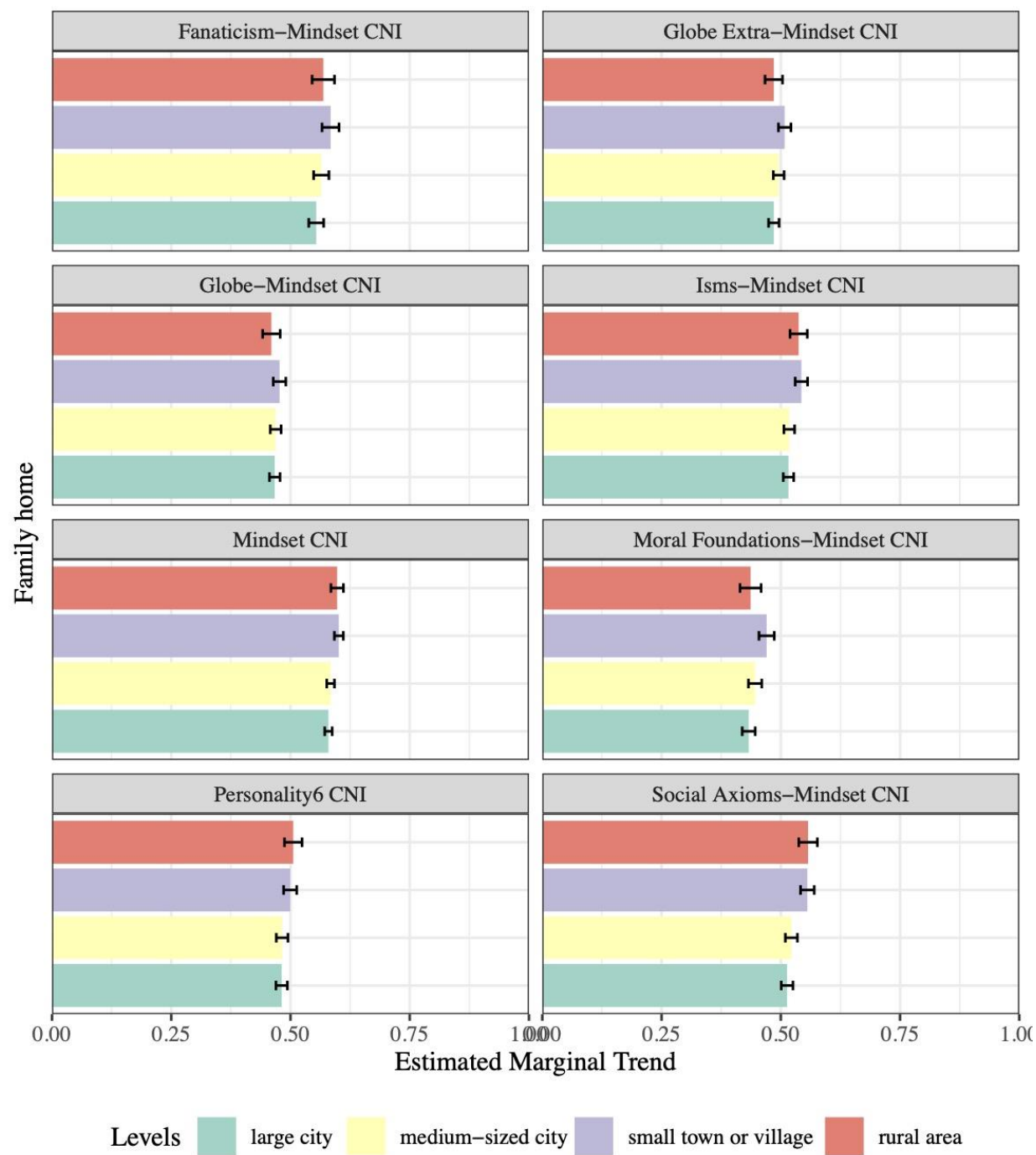


Figure 13

Estimated CNI by Mother's Education



Figure 14

Estimated CNI by Father's Education

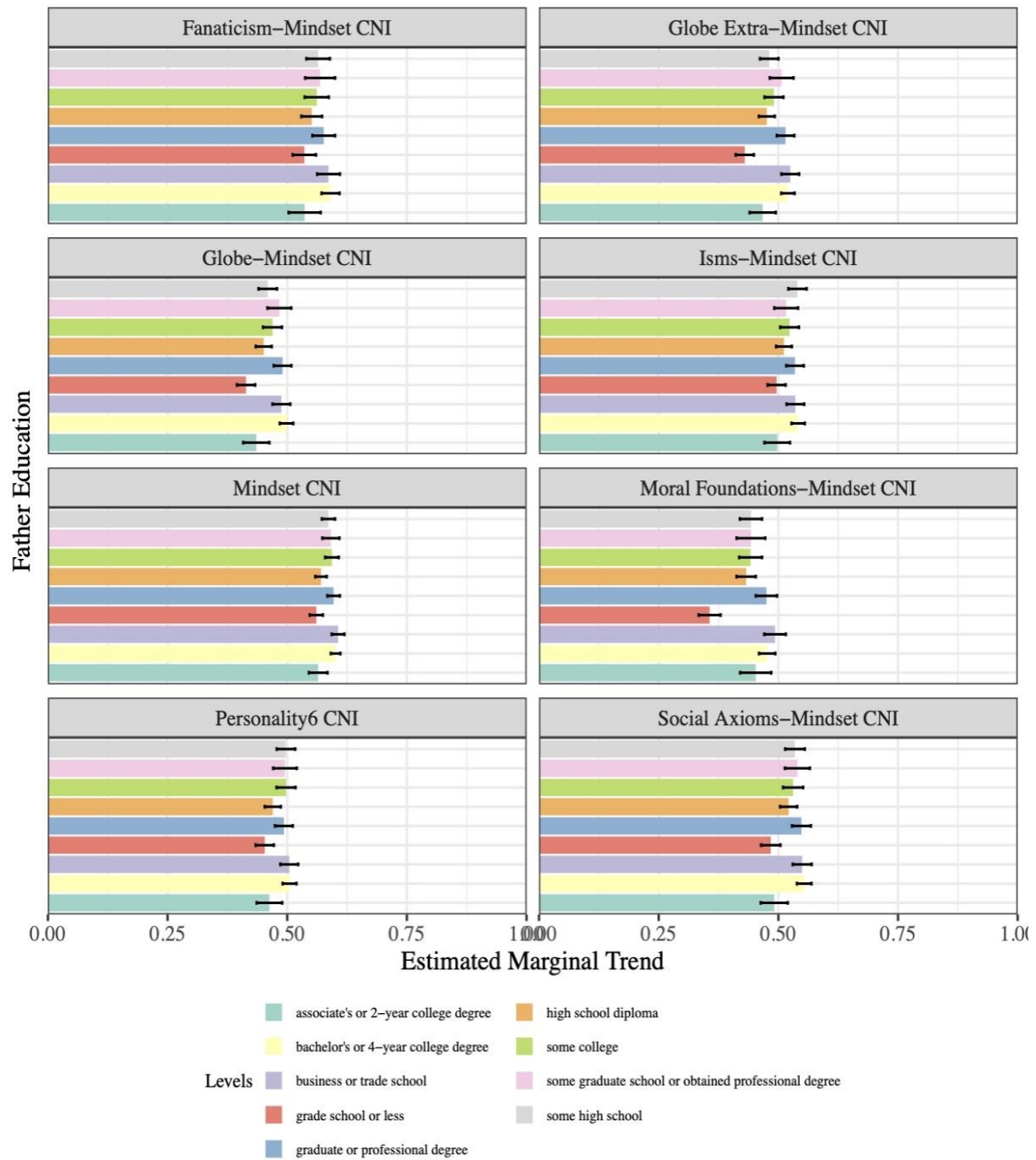
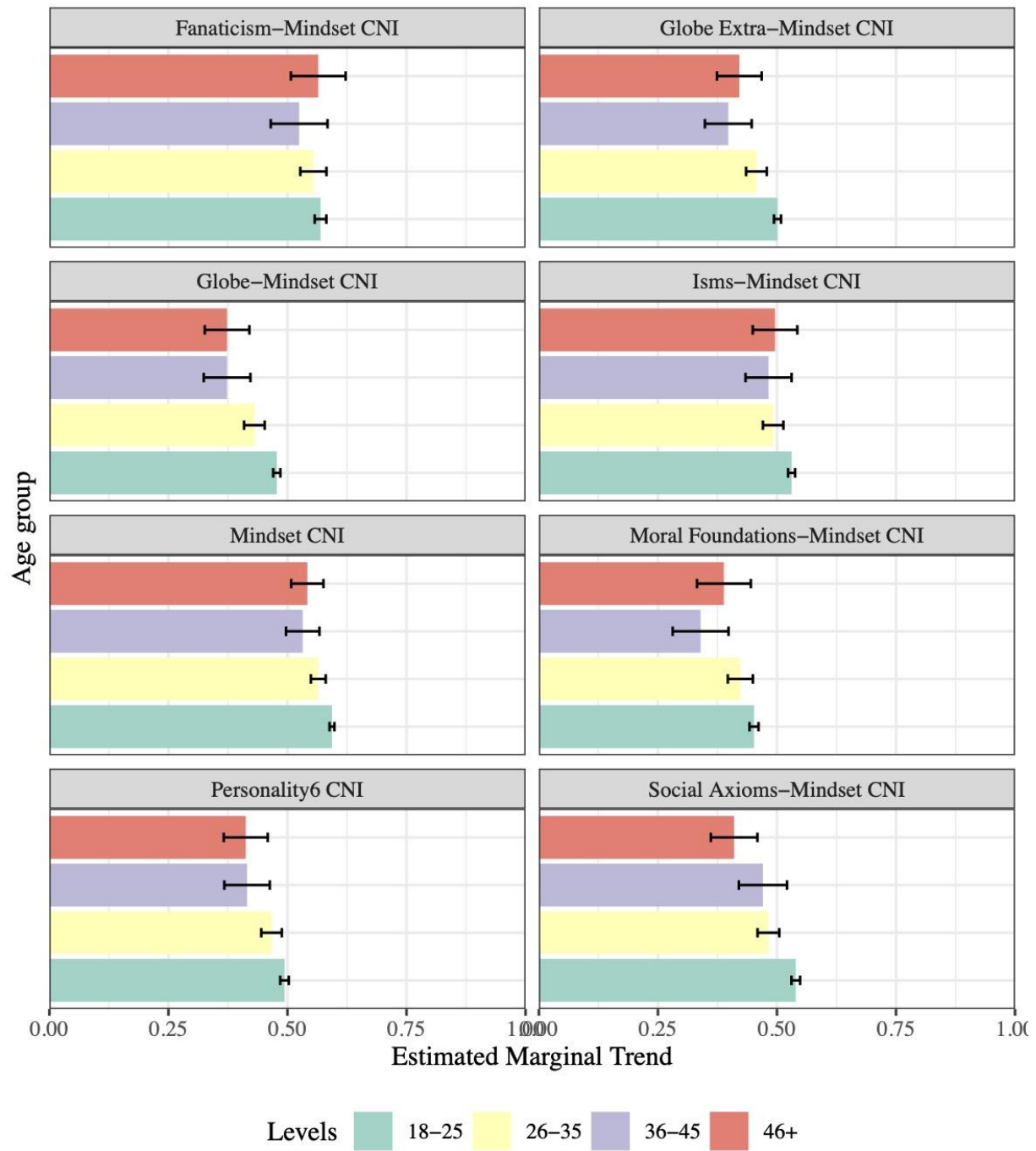


Figure 15

Estimated CNI by Age Group



Age

Age was significantly associated with the majority of CNI's – Mindset-CNI ($\chi^2(3) = 30.75, p < .001$), Personality6-CNI ($\chi^2(3) = 26.97, p < .001$), Isms-CNI ($\chi^2(3) = 16.84$, Fanaticism-CNI ($\chi^2(3) = 3.28, p > .05$). A common trend across all CNI types involved highest levels of CNI for age group 18-25 with a decrease in CNI in middle age (26-35 and 36- $p < .001$), GLOBE-CNI ($\chi^2(3) = 50.10, p < .001$), GLOBE Extra-CNI ($\chi^2(3) = 40.48, p < .001$), MF-CNI ($\chi^2(3) = 21.87, p < .001$), Social Axioms-CNI ($\chi^2(3) = 54.73, p < .001$) – except with Fanaticism-CNI ($\chi^2(3) = 3.28, p > .05$). A common trend across all CNI types involved highest levels of CNI for age group 18-25 with a decrease in CNI in middle age (26-35 and 36-45) and a slight increase in CNI in late adulthood (46+) (Figure 15). This lower CNI for middle age and late adulthood respondents might seem counterintuitive, since we might expect cultural normativity to generally increase with age. But respondents were recruited from educational institutions, and middle-age and older adults who are students at such institutions may have unconventional life-trajectories and may themselves tend to be rather unconventional – and that might predict lower CNI values.

Discussion: Study 2

Study 2 conceptualized eight types of CNI and investigated the influence of mindset and personality attributes along with demographic variables on CNI estimates. Linear and quadratic effects for continuous trait moderators were assessed at the individual and country-levels to study their influence on cultural normativity. For demographic variables the influence of individual level characteristics were assessed.

As in Study 1, CNI trends revealed greater variability in Personality-based CNI estimates compared to Mindset-based ones across countries. Additionally, various subtypes of

Mindset-based CNI showed high within-country variability, highlighting diversity in cultural alignment within these domains, consistent with the findings from Study 1. Fanaticism-CNI consistently produced the highest CNI estimates across countries, except in Malaysia, where SocAx-CNI recorded the largest estimate. Meanwhile, GLOBE-based and MF-CNI often competed for the lowest estimates across countries. Fanaticism-CNI, indicative of extremist thinking, may reflect societal pressures that emphasize greater alignment with the societal norms. Conversely, MF-CNI, which captures moral valuations often central to political discourse, may suggest a weaker alignment with such societal demands. The USA followed by Turkey showed greater overlap in the CNI estimates across types, while Malaysia followed by Morocco exhibited greater variation. As in Study 1, the range for Personality6-CNI estimates were consistently lower than Mindset-CNI estimates, except when they overlapped in the case of Philippines, Argentina, Mexico, Tanzania and Ethiopia.

With respect to associations with mindset and personality attributes, the latter most prominently emphasizing Big Two personality dimensions (*SSR* and *Dynamism*), emerged as significant and strong predictors of CNI at the country-level across several CNI types. *Dynamism* indicated positive quadratic (as well as linear) associations with all CNI's with the strongest association observed with MF-CNI at the country-level. This may be explained by the tendency of dynamic individuals to gain more social information through exposure, making them liable to be more directly affected by aggregate cultural patterns. In contrast, *SSR* demonstrated a more complex pattern. At the country level, it often showed negative quadratic relationships with CNI, whereas at the individual level, the associations were linear and positive (see Figure 11), albeit smaller in magnitude compared to *Dynamism*; this suggests that the covariation between *SSR* and CNI plateaus (or may even decline) at higher levels of *SSR*.

At the individual-level, the results could be explained by a tendency toward socially desirable responding. It is possible that countries that give latitude for more expression of *Dynamism* yield higher data quality, at least in the time-period being assessed in this study, and that helps boost CNI. *Dynamism* happens to average higher in countries where people are more accustomed to questionnaire responding and so generate less randomness in responding. Also, CNI is more likely to be profoundly affected by magnitude of exposure to social information than by self-regulating impulse control. Furthermore, where it is incumbent on people to develop or claim *SSR* traits (also *Agreeableness* as in Study 1), something leads people to be less affected/informed by real-world thinking/behavior diversity and so the expected contribution of *SSR* to CNI gets muted; possibly a third variable of collectivism is likely to be involved in the pattern in which case it is sensible that high *SSR* countries are also high on collectivism. Among the Big Five traits, *Extraversion* showed positive linear associations with cultural normativity at both individual and country-levels. Because *Extraversion* is a major component of *Dynamism*, it is possible that higher levels of Extraversion in general may mean greater familiarity with surveys and therefore less random responding leading to higher CNI scores. This is a reverberation of the *Dynamism* finding. Furthermore, *Agreeableness* – linked with the Big Two *SSR* – displayed significant nonlinear negative associations, specifically at the country level, echoing the *SSR* findings in Study 2.

Another aspect of the PCNI-personality attributes relationship was the difference in the magnitude of effects across Big Two and Big Six traits, specifically in case of Personality-based-CNI. One could hypothesize that the degree to which a personality trait scale incorporates all personality items in the dataset influences its association with (or predictive capacity for) Personality-based-CNI. In Study 2, the Big Two personality scales demonstrated

stronger predictive effects for Personality-based-CNI compared to the Big Six scales— which showed stronger effects in Study 1 (the Big Two was not assessed in Study 1)— simply because the Big Two scales are more likely to approximate the inclusion of all available items. If this hypothesis holds true, a Big One measure—representing an even broader aggregation of personality content—would likely perform even better, producing even stronger predictive effects on Personality-based-CNI. Thus, in addition to the hypothesis that (a) the Big Two are more closely related to Personality-based-CNI because they capture cultural content more effectively, a rival hypothesis can be proposed: (b) the stronger relationship between the Big Two and normativity could simply result from using more of the same items (and content) in the CNI and the trait indices. However, the country level quadratic associations with CNI in Study 2 (see Table 4.5) indicate the greater effect sizes for Mindset-based-CNI as compared to Personality6-CNI with the Big Two (as compared to the Big Six), thus refuting the matching content hypothesis. This pattern is also observed for linear associations at the country level (see Table 4.4.). The Big Two outperform Big Six even as we get beyond Personality-CNI to other kinds of CNI.

In case of mindset traits across multiple CNIs—particularly Mindset-, Isms-, GLOBE-, and MF-CNI—*Openness to Change* emerged as a significant predictor mainly at the country-level. The overall extent to which countries to which individuals belong value stimulation, or exciting and challenging life situations and self-direction, or creativity, curiosity and freedom, positively predicts individuals' CNI. Similarly, *Self-Transcendence* or the extent to which benevolence–helpfulness, honesty– and universalism – broad-mindedness, equality– is valued, consistently showed positive associations at both the individual and country-levels. Interestingly, both *Organizational* (and *Non-Organizational* for some CNI's) *Religious*

Activities exhibited negative linear relationships with cultural normativity at the country-level. Similar to *SSR*, it is plausible that country religiosity was confounded with being in the global south and having less exposure to psychological surveys or being higher on collectivism and perhaps as a result increased random responding or other response bias. As mentioned earlier, collectivism is likely to fog up perception of individual differences somewhat, as well as leading to less acquaintance with individual-differences measures. Comparatively higher levels of religious activities scores for the global south (e.g., Morocco, Tanzania, Malaysia) lends support to this argument.

An important contribution of Study 2 over Study 1 is the assessment of predictive associations between person level demographic characteristics and CNI. With regards to *Place of family home* (PoFH), SocAx-CNI demonstrated the strongest association, followed by Mindset and MF-CNI; the weakest association was with GLOBE-CNI. Overall individuals raised in small towns/village or rural areas were more likely to indicate greater cultural normativity. Urbanization may present different problems and require different strategies for adapting with the cultural context (Hatiboğlu & Habermas, 2016) and indeed may be a slightly different cultural context than the one general around the country. Urban environments are typically more diverse and dynamic; residents are exposed to a multitude of subcultures, lifestyles, and belief systems. The presence of diverse beliefs can encourage individuals to develop unique perspectives, decreasing the likelihood of adherence to any single set of cultural beliefs. One reason people move to cities is to find environments that tolerate their uniqueness. Cities, with their diverse subcultures, offer more opportunities to fit in compared to the limited options in rural areas. The large effect of PoFH with respect to SocAx-CNI, that propounds cultural congruity with respect to generalized beliefs encoded as perceived

relationships between two entities (e.g., “Kind-hearted people are easily bullied”), was noteworthy. The emphasis on generalized expectancies, that allow people to function within a society, in SocAx-CNI are highly sensitive to immediate social and cultural environments – shaped by local traditions, norms, and daily interactions– as compared to societal-level norms (GLOBE-CNI), universal moral intuitions (MF-CNI), or stable personality dispositions (Personality6-CNI), perhaps making them more influenced by place of upbringing.

Mother’s and father’s education were significantly associated with CNI; strongest association was with MF-CNI followed by GLOBE Extra-CNI. Participants with parents who attained higher education (bachelor’s degrees, graduate degrees, or trade school) generally showed higher cultural normativity. Elevated parental education, reflecting higher SES, implies greater access to resources, educational opportunities, and social networks that reinforce mainstream cultural values. Conversely, participants whose parents had lower education levels (grade school or less) tended to score lower on CNI, suggesting reduced conformity to cultural norms due to limited access to educational resources, exposure to dominant narratives, or different socialization practices. Education is a form of socialization or enculturation (Bruner, 1996), arguably more directly than employment in lieu of higher education. Individuals from more educated families may thus be more thoroughly socialized or enculturated. The CNI may, to some degree, measure the extent of enculturation, as individuals do not start resembling others in their population entirely by chance, instinct, or inevitable developmental processes. Interestingly, across both maternal and paternal education levels, Personality6-CNI may benefit from relatively lower levels of parental education in fostering cultural alignment in comparison to other CNI types. In other words, relatively equal levels of CNI were estimated across varying levels of parental education (e.g., estimated CNI was the same for paternal

education at graduate school level and high school level). This finding suggests that Personality-CNI may be less directly influenced by parental educational attainment compared to Mindset-based-CNI. By contrast, Mindset-CNI shows stronger associations with higher levels of parental education, perhaps due to greater exposure to broader societal beliefs and values that are more accessible through advanced educational experiences of parents. Higher education tends to enhance cognitive flexibility (Tucker-Drob & Harden, 2011) and exposure one's own cultural narratives, which may lead the children of such parents to adopt thinking patterns congruent with those of the children's social group. These influences can shape individuals' mindsets, potentially reinforcing culturally normative patterns of thought and behavior that align closely with those of their community.

The youngest age group (18–25) displayed the highest levels of cultural normativity, likely due to the sample's homogeneity, which was skewed toward individuals born around 1990. This demographic concentration indicates that younger participants are more likely to respond similarly to other young participants rather than to older participants. The country mean profile of responses is heavily influenced by how younger participants respond, giving them an advantage in resembling the average. In contrast, older participants, by responding in ways typical of their generation, tend to show slightly lower CNI. If the sample were predominantly older, the reverse pattern would likely emerge, with older participants showing higher CNI. Alternatively, as mentioned in the results section, it is also possible that older people who are in college are not typical of their age cohort and could possibly respond similar to other college students. Some CNIs, such as the GLOBE-, GLOBE Extra- and MF-CNI, showed slight elevations in the oldest age group (46+), above middle adulthood (26-35 and 36-45), indicating variations in the kind of norms that are central to varying age cohorts. However,

the exact nature of CNI cannot be inferred from these results as it will depend on what part of the population is sampled; the current samples cannot be said to be representative of the population within countries. CNI associations with age are influenced by sample biases, particularly the overrepresentation of younger, college-age individuals in the data. These findings highlight the dynamic nature of cultural normativity across lifespan. Lower normativity among these older participants may reflect that older adults recruited from college contexts may be poorly representative of other adults their age or may be individuals prone to be nonconformists in various ways. These results should be interpreted with caution as the mean response profiles were skewed or weighted toward the younger age cohort, which could potentially drive the effects observed.

To summarize, Study 2 established strong links between the Big Two (*Dynamism* and *SSR*) and CNI. Beyond Study 1, it also indicated important relationships between demographic characteristics such as *Place of Family home* and *Parental Education* on CNI.

CHAPTER V: GENERAL DISCUSSION

Together the two studies examined various instantiations of the Cultural Normativity Index (CNI), exploring how mindset attributes, personality traits, and demographic factors relate to cultural normativity at the individual and country-levels. By applying a profile-similarity approach to measuring CNI, the aim was to assess cultural sharedness and individual-level alignment with societal norms, thus offering insights into the dynamic interplay between person-level characteristics and cultural frameworks.

Characterization of CNI

The findings supported the variation in cultural sharedness as theorized by the Distributive Model of Culture (DMC), demonstrating that participants differed in their CNI magnitudes rather than all having similar values. Moreover, none of the participants were extremely highly correlated with everyone else in society based on their values, beliefs, or personality profiles. It is possible that some items or ideas are more culturally shared than others—for example, moral norms may be more cultural than observations about conventional behaviors (prescriptive vs. descriptive content). This was supported by higher mean estimates of Mindset-based-CNI compared to Personality-based-CNI across countries, suggesting that the former is more strongly reflective of cultural content. Furthermore, higher CNI estimates for participants from rural vs. urban family places of origin, and for those with higher vs. lower degrees of parental formal education (or SES), are consistent with the DMC's premise that culture is unevenly distributed within populations.

With respect to country trends, noteworthy similarities were observed between Study 1 and Study 2 across CNI types. Consistent with Study 1 findings, between-country comparisons revealed that Mindset-CNI estimates were consistently higher than Personality-based CNI

estimates, with the gap between them often substantial. Furthermore, Personality-CNI estimates displayed greater variability across countries compared to the relatively consistent magnitude of Mindset-CNI. This suggests that Mindset-CNI exhibits more stability across cultural contexts, indicating stronger and more uniform associations with its predictors across countries. In contrast, the associations between Personality-CNI and its predictors appear more heterogeneous. These findings reinforce the notion that Mindset-CNI may be superior among indices measuring cultural alignment. Additionally, Mindset-based-CNI's indicated high within-country variability across both studies. GLOBE-based-CNI estimates ranked among the lowest in both studies, with MF-CNI in Study 2 yielding even lower estimates. Conversely, Fanaticism-CNI estimates were consistently among the highest across both studies, while Isms-CNI also ranked among the highest in Study 1.

Amongst the Mindset-based-CNI, the two variants that indicated the greatest consistency, with the lowest confidence interval range, were Isms- and Mindset-CNI. Extremist thinking, as implicated in Fanaticism-CNI, might represent aspects of societal sanctions that demand greater alignment, whereas the opposite could be the case for moral emotions, as characterized by MF-CNI. A potential explanation for why Fanaticism-CNI tends to produce higher estimates across countries (as observed in both studies) lies in the inherently moral or moralistic nature of its item content (e.g., "If you are protecting what is sacred and holy, anything you do is moral and justifiable"). Moral normative standards are particularly salient to individuals and arguably central to cultural systems, which may drive higher levels of agreement. In contrast, the so-called Moral Foundations are more reflective of values that are differentially moralized by opposing political groups, making them distinct from a broader, universal conception of morality. Since moral foundations emphasize politically polarized

values, they may amplify within-culture disagreements, ultimately resulting in lower MF-CNI scores. To put it differently, if partisan political views alone were measured within a politically heterogeneous sample, the degree of convergence around mean responses would similarly be weak. Overall, these results suggest greater diversity in cultural alignment in these domains. Interestingly both studies indicated that the USA showed greatest overlap in the CNI estimates across types, while Malaysia exhibited greatest variation. These results suggest that there is some systematicity in the way CNI taps into cultural differentiations.

Predictive Capacity of Personality and Mindset Attributes

In examining the association between CNI and personality traits, a key finding from these studies is that the Big Two—*Dynamism* and *Social Self-Regulation (SSR)*—in Study 2, along with their related attributes in Study 1 (*Extraversion, Resilience, Originality, Assertiveness* linked to *Dynamism*; *Agreeableness, Conscientiousness, Institutional Collectivism* linked to *SSR*), demonstrated stronger predictive effects for CNI. These findings prompted a post-hoc analysis, assessing the predictive effects of the Big Two measures in Study 1¹². The consistently strong associations with CNI across both studies suggest that the Big Two inherently exhibit stronger links with CNI. If this hypothesis holds, the Big Two measures in Study 1, despite being assessed with fewer items than in Study 2, were still expected to generate substantial effects with CNI. Before proceeding one should consider several factors that may potentially affect the results of this analysis. Study 2 offered a more comprehensive assessment by using ten items to measure each Big Two dimension across twenty-seven countries, equally representing the Global North and South. In contrast, Study 1

¹² The Big Two were initially excluded from the Study 1 analysis due to the limited number of items, which did not encompass all ten original items used in Study 2. However, the intriguing findings from Study 2 prompted a subsequent analysis of the Study 1 data to validate the observed trends.

used only six items per dimension, making it a less comprehensive measure, and included data from just eight countries not including any from Africa or South Asia. Additionally, Study 2 had a higher number of items, as compared to Study 1, in general for assessing CNI types, except in case of Fanaticism-CNI. These characteristics of the data were anticipated to influence the results.

Results for Study 1 data revealed that at the country-level, large negative non-linear effect sizes were observed for Personality-based-CNI (Table 5.1). Similar trends were reported for GLOBE-, Mindset-, and Fanaticism-CNI, specifically for *Dynamism*. Study 1 Big Two-CNI results replicated the Study 2 results with respect to individual level linear associations (for *Dynamism* and *SSR*), country-level linear associations for *Dynamism*, and country-level quadratic associations for *SSR*; this can be viewed as almost half the pattern from Study 2 being replicated. Some of the Study 2 associations – Personality-based-, GLOBE- and Mindset-CNI types– are reversed in Study 1 data, mainly involving quadratic associations with *Dynamism*. In case of *SSR*, while Study 2 indicated a higher number of negative associations, there were smaller magnitudes of positive associations observed, mainly consisting of linear relationships; whereas in Study 1, *SSR* associations indicated both positive and negative associations across CNI types (see Figure 12). More specifically, in Study 1, *SSR* demonstrated positive linear individual-level associations as well as the negative quadratic country-level associations; the other two types of association (nonlinear individual-level and linear country-level) were null (very close to zero) or indeterminate in contrast to study 2 data. Specifically for Personality-CNI, the negative nonlinear country-level associations in Study 2, were reversed with Study 1 indicating strong positive associations. Overall, the individual-level quadratic associations with Big Two from Study 2 were not well reproduced in study 1 post

hoc analysis. On the other hand, several country-level associations were replicated across the two studies (e.g., positive linear association between *Dynamism* and Fanaticism-CNI had at the country level). It is possible that quadratic effects at the individual level, do not replicate well across the two studies.

To touch upon the Big Six, negative CNI associations with country-level *Agreeableness* (related to *SSR*) in Study 1, were also among the notable findings. Interpretation of this finding is somewhat difficult, but here are some possible ways of understanding it. *Agreeableness* is characterized by tendencies such as tolerating mistakes, slights, and overall making nice and thus suppressing conflict. The inclusion of tendencies to get angry in this measure of *Agreeableness* may emphasize conflict-suppression with a stress on argument-suppression. Arguments have the benefit of bringing out different points of view (e.g., about some daily events) and expression of diverse thought and behavior; conflict suppression may exert forces that lead everyone to view themselves as agreeable, and hence erroneously perceive that others are similar to them. *Agreeableness* especially at high levels may lead people to paper over differences and as a result get slightly more out of the touch with the various streams of cultural reality. In that sense very high *Agreeableness* might take on some naivete about differences in viewpoints within ones population and possibly misconstruing how others in one's society really think (i.e. indicating low GLOBE-CNI).

In summary, the two studies demonstrated that, personality variable variation (e.g., Big Two, Big Six dimensions) was found to be more strongly related to Personality-based-CNI. The findings of the two studies include (a) both Big Two dimensions are positively (linearly) associated with CNI at individual level, but (b) this only generalizes clearly to country-level data for *Dynamism*. Also (c) at country level only, *SSR* has persistent negative quadratic

associations with CNI. These three findings are replicated across two studies. This further provided support for the possibility that Personality-CNI is more closely associated with personality dimensions as compared to other dimensions. The potential effect of method-matching (similarity in the PE-fit/CNI and predictor trait domain) may conceivably lead to inflated estimates, and the lower consistency/reliability of Personality-CNI profiles in some countries could further indicate trouble for exporting this approach to some non-Western cultures. However, in case of other CNI types, they also tended to be more strongly associated with the personality dimensions as compared to other Mindset variables. In fact, the Big Two indicated the strongest effects with CNI across all Mindset and Personality attributes, indicating that the Big Two indeed explain some systematic variation in CNI. One could argue that their predictive strength might stem from having a larger number of items compared to the Big Six. However, this is not sufficiently supported given that despite significant content overlap with *Extraversion*, *Dynamism* consistently exhibits larger effects. Having said that, future research could consider this when considering the domains characterizing CNI and that of the attributes predicting CNI.

Moving to the Mindset attributes that indicated strong effects predicting CNI, these included GLOBE constructs (*Assertiveness*, *Future Orientation*, *Ingroup Collectivism*), Schwartz Values (*Openness to Change*, *Self-Transcendence*, *Self-enhancement*), *Civic Multicultural Nationalism* and *Organizational Religious Activity*. The relatively large effects observed for GLOBE and Schwartz Values along with religious activities, specifically at the country-level, are indicative of the characteristic nature of CNI. The extent to which individuals align with their culture is deeply influenced by collective factors— influencing the individual, or the individual adopting views, values, beliefs —that perhaps play into collective

patterns such as national cultural practices, shared values, and institutionalized behaviors. For instance, CNI can be predicted by the degree to which people think people in their society as a whole tend to engage in long term planning (*Future Orientation*) indicating that it somehow captures whether people put a premium on being spontaneous.

Table 5.1

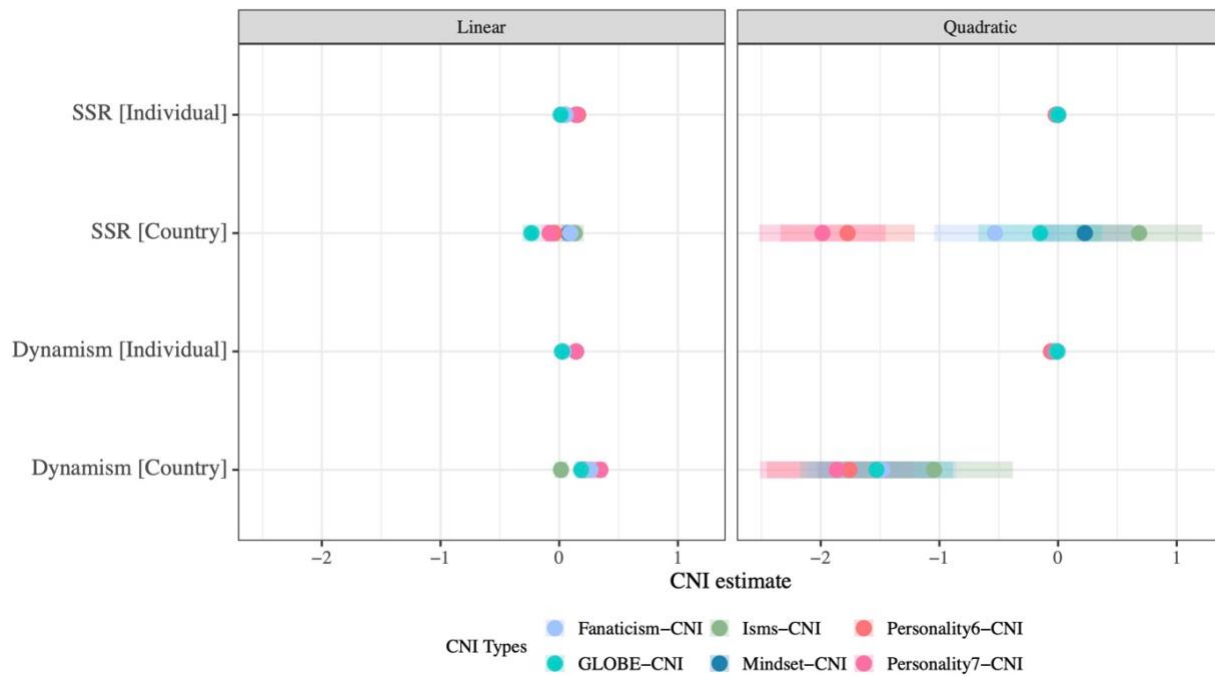
Study 1: Highest Effect Sizes for Big Two Across CNI Types

CNI type	Trait	Term	Est	95% CI
Personality 7	Social Self-Regulation*	(b ²)	-1.986	[-2.519, -1.452]
Personality 7	Dynamism*	(b ²)	-1.864	[-2.512, -1.216]
Personality 6	Social Self-Regulation*	(b ²)	-1.774	[-2.34, -1.208]
Personality 6	Dynamism*	(b ²)	-1.758	[-2.454, -1.062]
GLOBE	Dynamism*	(b ²)	-1.530	[-2.174, -0.886]
Mindset	Dynamism*	(b ²)	-1.530	[-2.027, -1.033]
Fanaticism	Dynamism*	(b ²)	-1.481	[-2.106, -0.857]
Personality 7	Dynamism*	(b)	0.347	[0.293, 0.400]
Fanaticism	Dynamism*	(b)	0.263	[0.212, 0.315]
Personality 6	Dynamism*	(b)	0.261	[0.204, 0.318]
GLOBE	Social Self-Regulation*	(b)	-0.234	[-0.308, -0.16]
Mindset	Dynamism*	(b)	0.190	[0.149, 0.23]
GLOBE	Dynamism*	(b)	0.184	[0.131, 0.237]
Personality 6	Social Self-Regulation†	(b)	0.159	[0.145, 0.173]
Personality 7	Dynamism†	(b)	0.143	[0.127, 0.159]
Personality 6	Dynamism†	(b)	0.141	[0.124, 0.158]
Personality 7	Social Self-Regulation†	(b)	0.139	[0.125, 0.152]
Isms	Social Self-Regulation*	(b)	0.131	[0.055, 0.206]
Personality 6	Dynamism†	(b ²)	-0.06	[-0.081, -0.039]
Fanaticism	Social Self-Regulation†	(b)	0.055	[0.041, 0.069]

Note: Country-level*, Individual-level†; cross-level interaction effects in Linear Model 3.1 [(b) = ($\beta_{1t}\mu_{11}$)] and Quadratic Model 3.2 (b²) = ($\beta_{1t}\mu_{12}$); all effects are significant at p<.001.

Figure 16

Study 1: All Effect Sizes for Big Two Across CNI Types



Note: SSR = Social Self-Regulation; cross-level interaction effects ($\beta_{1t}\mu_{11}$) in the Linear Model 3.1, and ($\beta_{1t}\mu_{12}^2$) in the Quadratic Model 3.2 are plotted.

Comments on the Methodology

Quadratic and Linear Effects

In comparing the trends in continuous predictors for CNI across the two studies (see RQ 3), a notable trend is the weaker stability of quadratic associations with CNI compared to linear ones. The GLOBE(Extra)-CNI-and-*Dynamism* (GLOBE-*D*), Mindset-CNI-and-*Dynamism* (Mindset-*D*) and Fanaticism-CNI-and-*SSR* (Fanaticism-*SSR*) country level quadratic associations were found across both studies, but the associations indicated opposite directions. While Study 1 (Table 5.1) indicated negative associations, Study 2 (Table 4.5) indicated positive ones for GLOBE-*Dynamism* and Mindset-*Dynamism*; the opposite was the case for Fanaticism-*SSR*. While there seems to be a weak pattern (*SSR* with country-level quadratic CNI associations), the direction of the association remains unclear. For robust

quadratic associations, these studies do not provide strong evidence, unlike the case with linear ones. An exploration of this pattern may benefit from the perspective of Item Response Theory (IRT), a framework that is conceptually also linked to Multilevel Modeling. Two parameters in the IRT are crucial to this discussion – Item Discrimination (measures how well an item differentiates between individuals with high and low levels of a latent trait) and Item Difficulty (reflects the point on the latent trait scale where the probability of endorsing an item is 50%).

In the Model 3.1 (rewritten below from RQ 3) μ_{11} captures the linear relationship between the individual trait $(Trait)_{1t}$ and the slope of the country-level predictor β_{1t} . It captures how strongly *Self-Rating* vary with the *CountryAverage* across levels of the *Trait*. In that sense the cross level effect associated with μ_{11} acts like a discrimination parameter as it represents the degree to which the $(Trait)_{1t}$ differentiates the strength of the relationship between *Self-Rating* and *CountryAverage* (β_{1t}) or CNI across individuals. On the other hand, in the Model 3.2 μ_{12} , the quadratic effect for *Trait*, represents a non-linear relationship between the trait and the slope β_{1t} . This non-linear term can shift or distort the relationship between *Self-Rating* and *CountryAverage*, analogous to how difficulty parameters influence response probabilities in IRT depending on the latent trait level. μ_{12} then captures variations in response distributions across levels of the trait, similar to how difficulty parameters shift the “location” of responses along the latent trait scale. In IRT, it is generally true that difficulty parameters tend to be more variable across different samples compared to discrimination parameters. Discrimination tends to be more stable because it measures the sensitivity to differences in the trait, which is less influenced by sample-specific factors. Higher variability in Difficulty are typically attributed to differences in group abilities, cultural contexts, or educational backgrounds, which affect how “difficult” an item appears to different populations. It is

possible then that the nonlinear effects (analogous to Difficulty) are more likely to be influenced by other sample characteristics making them more unstable.

Level 1 (Linear Model 3.1)

$$Self-Rating_{it} = \beta_{0p} + \beta_{1t}(CountryAverage)_{it} + r_{it}$$

Level 2

$$\beta_{0p} = \mu_{00}$$

$$\beta_{1t} = \mu_{10} + \mu_{11}(Trait)_{1t} + u_{1t}$$

Level 1 (Quadratic Model 3.2)

$$Self-Rating_{it} = \beta_{0p} + \beta_{1t}(CountryAverage)_{it} + r_{it}$$

Level 2

$$\beta_{0p} = \mu_{00}$$

$$\beta_{1t} = \mu_{10} + \mu_{11}(Trait)_{1t} + \mu_{12}(Trait^2)_{1t} + u_{1t}$$

As for country-level linear associations the large effect sizes in comparison to the individual-level ones, there is a tremendous amount of noise reduction via aggregation at the country-level analyses. Country-level data represent data points which are themselves aggregates (means of samples, etc.), which tend to treat individual variability as error and highlight broader trends at the level of comparing groups. This aggregation can lead to more pronounced effect sizes, and this can increase the apparent predictive capacity for CNI. Aggregation of data ignores individual variation as if it were only a type of statistical noise or measurement error (Pollet et al., 2015). This reduction can result in larger and more significant slope coefficients at Level 2, as the predictor variable is measured with greater reliability. While making inferences based on these effects, one might erroneously assume that country-level effects should all manifest in the same way at the individual level. A future suggestion for

addressing this issue would involve evaluating the variance component u_{1t} (Model 3.1, 3.2) at Level 2 to understand the extent of unexplained variability in β_{1t} (or CNI) after accounting for the predictor trait. A significant variance component would suggest that other unmeasured factors may influence β_{1t} . Another way to address this issue would be comparing nested models (with and without the trait) to assess its impact on β_{1t} . Likelihood ratio tests or information criteria (e.g., AIC, BIC) could be used to determine if the inclusion of the trait significantly improved model fit.

A more computationally intensive but effective approach is sensitivity analysis involving systematically varying the μ_{11} or the cross-level interaction associated with the *trait* in Level 2 and observing the resulting changes in β_{1t} . This procedure would consist of generating a range of trait values as specified by the (range or distribution of) data and comparing μ_{11} values across actual and generated data. The assessment would be based on whether changes in the trait lead to significant variations in β_{1t} . In the present studies, caution while interpretation of results was exercised to mitigate the risk of ecological fallacy — drawing incorrect conclusions about individuals based on group-level data. For a country level attribute in Model 3.1 and 3.2, the relationship between alignment of an individual with their cultural profile was modeled (in terms of whether it can be predicted) by the average attribute level of the culture to which they belong. It is the culture's average level attribute that predicts CNI; any deviation from this could give way to erroneous conclusions. For instance, the country-level-attribute effects do not make predictions about overall country CNI levels or say anything about how CNI functions within some countries.

In order to observe the relationship between country (or individual) level attribute across countries, one would need to introduce another cross-level interaction in the model (see Model 5) wherein only the interaction effects in Level 2 are varied at Level 3 for the country.¹³

Level 1 (Model 5)

$$Self-Rating_{ipc} = \beta_{0pc} + \beta_{1pc}(CountryAverage)_{ipc} + r_{ipc}$$

Level 2

$$\beta_{0pc} = \mu_{00c}$$

$$\beta_{1pc} = \mu_{10c} + \mu_{11c}(Trait)_{pc} + \mu_{12c}(Trait^2)_{pc} + u_{1pc}$$

(Level 3)

$$\mu_{10c} = \gamma_{100}$$

$$\beta_{1pc}\mu_{11c} = \gamma_{110} + v_{11c}$$

$$\beta_{1pc}\mu_{12c} = \gamma_{120} + v_{12c}$$

Future explorations with this model could inform whether the predictive effects of the attributes measured varied based on countries. Specifically, distinguishing between nations in the Global South and Global North could provide insights into cultural disparities and variations in the observed effects.

Measuring CNI

With regards to measurement of CNI, these studies provide some interesting insights. For instance, the referent-shift items, (as in the case of GLOBE and GLOBE-Extra CNI) in theory should have elicited more agreement (and thus higher CNI) than other items. However,

¹³ The focus in the model is only on identifying if the interaction effect ($\beta_{1pc}\mu_{12c}$) varies across countries in (Level 3), hence all the effects (specifically, main effects for the linear and quadratic terms) predicting (β_{1pc}) in Level 2 were not varied.

results across the two studies seem to refute this theory. This could be indicative of a pluralistic ignorance phenomena-tendency to privately reject a norm or belief but assume, incorrectly, that most others accept it. Alternatively, it could just mean that individuals (perhaps more so in some countries as opposed to others) are unfamiliar with the task of rating what people in their society tend to think or simply tend to be bad at discerning what their larger group tendency is, and so tend to misrepresent it. The collective misrepresentation of what is considered as true in a given society could in this case confound measurement of CNI. The low GLOBE-based CNI estimate values could then be a result of extreme variability in responding as observed across countries. Study 2 revealed MF-CNI estimates as even lower, especially in the Global South (e.g., Morocco, Ethiopia, Bangladesh). It is possible that moral values (often emotion-driven moral values) of the sort that tend to be associated with political polarization (particularly in the United States) call for a different framework or measure of assessment for people in the Global South or that they are less familiar with this form of thinking causing higher instances of random responses. Overall, the format and framing of items is crucial for studying culture-fit. However, another explanation would be that moral-foundations items tend to emphasize politically divisive issues that are associated with variation in moral values, and where items have high variability (and even sometimes bimodal distributions) they will generate an average response-profile that differs a good deal from the responses of many individuals, generating low CNI values if based on such items.

Assessing the predictive capacity of CNI for Subjective-wellbeing (SWB), Personality-CNI outperformed Mindset-CNI. The latter along with Isms-CNI, when added in the model along with Personality-CNI, absorbed variance that is not directly related to SWB but is shared with Personality-CNI, thereby enhancing the ability of Personality-CNI to predict SWB more

accurately. There suppressor effects suggest that for interventions aimed at improving SWB through cultural normativity, focusing on personality alignment may be more effective. As for why Personality-CNI was more related to SWB reports than was mindset-CNI, this could be due to partial content overlap between personality and well-being measures (e.g., SWB includes being cheerful, energetic, and not anxious or melancholic).

Limitations and Future Directions

A key consideration when calculating the CNI was determining the appropriate level of nesting in the data that the model could effectively account for. The decision to exclude Level 4, which involved nesting countries within world regions, followed an evaluation of the challenges it introduced. An unbalanced data structure, with some regions overrepresented by larger sample sizes, could result in issues like degeneracy due to insufficient variability across regions. In Study 1, some regions included only a single country, and some world regions were entirely unrepresented. This imbalance could prevent the model from distinguishing between certain random effects or variance components or cause the variance at Level 4 to approach zero, leading to flat likelihood surfaces. Additionally, the increased complexity of a four-level model raises the risk of overparameterization, making it difficult to obtain reliable estimates, causing convergence issues. A three-level model was chosen to mitigate these risks and avoid overfitting.

A key insight from the use of MLM methodology in this study is that data quality for survey items across various psychological domains could vary across samples. The data quality may be a major source of variation in the magnitude of CNI coefficients; familiarity with the item content and format could potentially impact the likelihood of random responding. For example, the association of CNI with parental education implies that higher education could

mean higher CNI, and likely less education not only means lower CNI tendency, but also perhaps poorer data quality. Another limitation with respect to the sampling was that it came from student populations at postsecondary institutions (i.e., beyond high school). These samples do not fully represent all age groups in the broader population as they tend to overrepresent a narrow swath of the age range (3 or 4 years is not much to compare), and to the extent they represent adults over age 23 or so, they do so poorly because older-adult college students tend to be unrepresentative of their age cohort. This made it impossible to do meaningful comparisons on the age variable for the most part.

Given the lesser representativeness of countries in Study 1, findings from Study 2 may need to be given greater weight. However, the interpretation and discussion of results have tended to treat both studies as having equal value. Also, several interesting findings in Study 2 could not be examined in Study 1 because the relevant variables were not included there, and the reverse is true for well-being results (available in Study 1 but not in Study 2). With respect to the linear and quadratic effects, for the time being, they were treated as qualitatively different. Deriving R^2 estimates that would enable fair and direct comparison of linear and quadratic effect across personality and mindset attributes (see RQ3), as well as comparing the models with varying types of CNI in case of categorical variables (see RQ 4), is a rather demanding further task that would be a useful addition to this work. Based on these studies, it is hard to say to what extent method-matching (*monomethod* results being compared to *heteromethod* results; e.g., Personality-CNI and Big Two link vs. Mindset-CNI and Big Two link) inflates coefficients, though evidence suggests some inflation; future studies could explore this issue. Some associations, such as the MF-CNI and Big Two link, were difficult to interpret and explain, warranting additional studies to examine their robustness and clarify their

implications. There may be important aspects of cultural mindset left out of these studies that should be incorporated in future studies.

Comparative explorations between CNI's could drive insights about within person differences in understanding cultural differences. While Study 1 did use a comparative approach for CNI's in the context of subjective-wellbeing, further research could extend this to assessments of other traits. This would also aid in identifying the relevance of a cultural domain by assessing its comparative advantage over other domain(s). More representative datasets that may help to identify which CNI-type, is truly representative of culture-fit. Also, interesting would be understanding within-person differences in CNI-types. Given the present results, it is possible that Personality- and Mindset-CNI share similarities with respect to content (e.g., openness and supernatural beliefs) that could have important implications for other psychological traits. With respect to assessing the relationship between well-being and CNI, *Meaning in Life* (MiL)—experiencing life as having purpose, significance or coherence (Heintzelman & King, 2014) – could potentially be an important contribution to our understanding of the characteristic nature of CNI. Whether people who are more aligned to their culture also attribute greater meaning to life could be an important outcome of cultural normativity in its own right, while being distinctive from well-being, and would benefit from more attention. Together, these efforts will further elucidate the role of person-environment fit in the context of cultural psychology.

Conclusion

This research contributes to our understanding of cultural normativity by examining how individual traits, mindsets, and demographic factors interact with cultural alignment (i.e., the varying degrees of alignment individuals have with the culture of their society, as revealed

by the profile of their questionnaire responses). The findings underscore the importance of personality traits, especially the Big Two, in predicting cultural normativity. The studies also highlight significant demographic influences, such as place of family home and parental education, suggesting the dynamic nature of cultural normativity across social contexts.

REFERENCES

- Abdullahi, A. M., Orji, R., Rabi, A. M., & Kawu, A. A. (2020). Personality and subjective well-being: Towards personalized persuasive interventions for health and well-being. *Online Journal of Public Health Informatics*, 12(1), e1. <https://doi.org/10.5210/ojphi.v12i1.10335>
- Andersson, J. O. (2023). Explaining Finnish economic and social success – And happiness. *Studia Europejskie - Studies in European Affairs*, 26(4), 177–198. <https://doi.org/10.33067/SE.4.2022.7>
- Atherton, O. E., Willroth, E. C., Graham, E. K., Luo, J., Mroczek, D. K., & Lewis-Thames, M. W. (2024). Rural-urban differences in personality traits and well-being in adulthood. *Journal of Personality*, 92(1), 73–87. <https://doi.org/10.1111/jopy.12818>
- Barranti, M., Carlson, E. N., & Côté, S. (2017). How to test questions about similarity in personality and social psychology research: Description and empirical demonstration of Response Surface Analysis. *Social Psychological and Personality Science*, 8(4), 465–475. <https://doi.org/10.1177/1948550617698204>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67, 1–48. <https://doi.org/10.18637/jss.v067.i01>
- Berntsen, D., & Rubin, D. C. (2004). Cultural life scripts structure recall from autobiographical memory. *Memory & Cognition*, 32(3), 427–442. <https://doi.org/10.3758/BF03195836>

- Bleidorn, W., Schönbrodt, F., Gebauer, J. E., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2016). To live among like-minded others: Exploring the links between person-city personality fit and self-esteem. *Psychological Science*, 27(3), 419–427.
<https://doi.org/10.1177/0956797615627133>
- Bouchard, T. J. (2004). Genetic influence on human psychological traits: A survey. *Current Directions in Psychological Science*, 13(4), 148–151. <https://doi.org/10.1111/j.0963-7214.2004.00295.x>
- Brauer, K., Sendatzki, R., Gander, F., Ruch, W., & Proyer, R. T. (2022). Profile similarities among romantic partners' character strengths and their associations with relationship and life satisfaction. *Journal of Research in Personality*, 99, 104248.
<https://doi.org/10.1016/j.jrp.2022.104248>
- Brouwer, T., Galeotti, F., & Villeval, M. C. (2023). Teaching norms: Direct evidence of parental transmission. *The Economic Journal*, 133(650), 872–887.
<https://doi.org/10.1093/ej/ueac074>
- Bruna, F. (2022). Happy cultures? A multilevel model of well-being with individual and contextual human values. *Social Indicators Research*, 164(1), 55–77.
<https://doi.org/10.1007/s11205-021-02858-6>
- Bruner, J. S. (1996). *The culture of education* (pp. xvi, 224). Harvard University Press.
- Buss, D. M. (2009). How can evolutionary psychology successfully explain personality and individual differences? *Perspectives on Psychological Science*, 4(4), 359–366.
<https://doi.org/10.1111/j.1745-6924.2009.01138.x>

- Chen, Z. J., Hsu, K., Zhou, X., & Saucier, G. (2018). Chinese isms dimensions in mainland China and Taiwan: Convergence and extension of American isms dimensions. *Journal of Personality*, 86(3), 555–571. <https://doi.org/10.1111/jopy.12336>
- D'Andrade, R. G. (1992). Afterword. In R. G. D'Andrade & C. Strauss (Eds.), *Human motives and cultural models*. Cambridge University Press.
<https://doi.org/10.1017/CBO9781139166515>
- D'Andrade, R. G. (2008). *A study of personal and cultural values: American, Japanese, and Vietnamese* (1st ed.). Palgrave Macmillan.
- Denzau, A. T., & North, D. C. (1994). Shared mental models: Ideologies and institutions. *Kyklos*, 47(1), 3–31. <https://doi.org/10.1111/j.1467-6435.1994.tb02246.x>
- Dressler, W. W. (2018). Cultural consonance. In D. Bhugra & K. Bhui (Eds.), *Textbook of cultural psychiatry* (2nd ed., pp. 194–204). Cambridge University Press.
<https://www.cambridge.org/core/books/textbook-of-cultural-psychiatry/cultural-consonance/60DD5DA381244DAE546468689ECB33FB>
- Dressler, W. W., Balieiro, M. C., Ribeiro, R. P., & dos Santos, J. E. (2016). Culture and the immune system: Cultural consonance in social support and C-reactive protein in urban Brazil. *Medical Anthropology Quarterly*, 30(2), 259–277.
<https://doi.org/10.1111/maq.12213>
- Dressler, W. W., Balieiro, M. C., Ribeiro, R. P., & Santos, J. E. D. (2007). Cultural consonance and psychological distress: Examining the associations in multiple cultural domains. *Culture, Medicine and Psychiatry*, 31(2), 195–224. <https://doi.org/10.1007/s11013-007-9046-2>
- Ember, C. R., Ember, M., & Peregrine, P. N. (2015). *Anthropology* (14th edition.). Pearson.

- Etzel, J. M., Lüdtke, O., Wagner, J., & Nagy, G. (2019). Similarity of vocational interest profiles within families: A person-centered approach for examining associations between circumplex profiles. *Journal of Personality*, 87(3), 593–606.
<https://doi.org/10.1111/jopy.12418>
- Fine, G. A. (2001). Enacting norms: Mushrooming and the culture of expectations and explanations. In M. Hechter & K.-D. Opp (Eds.), *Social norms* (pp. 139–164). Russell Sage Foundation.
- Fischer, R. (2004). Standardization to account for cross-cultural response bias: A classification of score adjustment procedures and review of research in JCCP. *Journal of Cross-Cultural Psychology*, 35(3), 263–282. <https://doi.org/10.1177/0022022104264122>
- Fox, J., & Weisberg, S. (2019). *An R companion to applied regression* (3rd ed.). Sage.
<https://www.john-fox.ca/Companion/index.html>
- Fulmer, C. A., Gelfand, M. J., Kruglanski, A. W., Kim-Prieto, C., Diener, E., Pierro, A., & Higgins, E. T. (2010). On “feeling right” in cultural contexts: How person-culture match affects self-esteem and subjective well-being. *Psychological Science*, 21(11), 1563–1569. <https://doi.org/10.1177/0956797610384742>
- Gebauer, J. E., Eck, J., Entringer, T. M., Bleidorn, W., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2020). The well-being benefits of person-culture match are contingent on basic personality traits. *Psychological Science*, 31(10), 1283–1293.
<https://doi.org/10.1177/0956797620951115>

- 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 (New York, N.Y.)*, 332(6033), 1100–1104. <https://doi.org/10.1126/science.1197754>
- Georgas, J. (1989). Changing family values in Greece: From collectivist to individualist. *Journal of Cross-Cultural Psychology*, 20(1), 80–91. <https://doi.org/10.1177/0022022189201005>
- Gilbreath, B., Kim, T.-Y., & Nichols, B. (2011). Person-environment fit and its effects on university students: A response surface methodology study: Research in Higher Education. *Research in Higher Education*, 52(1), 47–62. <https://doi.org/10.1007/s11162-010-9182-3>
- Gil-White, F. J. (2005). How conformism creates ethnicity creates conformism (and why this matters to lots of things). *The Monist*, 88(2), 189–237. <https://www.jstor.org/stable/27903926>
- Goodenough, W. H. (n.d.). *Culture, language and society*.
- Goodenough, W. H. (1981). *Culture, language, and society* (2nd ed., 1–1 online resource (ix, 134 pages)). Benjamin/Cummings Pub. Co. <http://books.google.com/books?id=4k-wAAAAIAAJ>
- Götz, F. M., Ebert, T., & Rentfrow, P. J. (2018). Regional cultures and the psychological geography of Switzerland: Person–Environment–Fit in personality predicts subjective wellbeing. *Frontiers in Psychology*, 9. <https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00517>

- Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S. P., & Ditto, P. H. (2013). Chapter two - Moral foundations theory: The pragmatic validity of moral pluralism. In P. Devine & A. Plant (Eds.), *Advances in experimental social psychology* (Vol. 47, pp. 55–130). Academic Press. <https://doi.org/10.1016/B978-0-12-407236-7.00002-4>
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, 96(5), 1029–1046. <https://doi.org/10.1037/a0015141>
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology*, 101(2), 366–385. <https://doi.org/10.1037/a0021847>
- Grossmann, I., & Varnum, M. E. W. (2011). Social class, culture, and cognition. *Social Psychological and Personality Science*, 2(1), 81–89. <https://doi.org/10.1177/1948550610377119>
- Haidt, J. (2008). Morality. *Perspectives on Psychological Science*, 3(1), 65–72. <https://doi.org/10.1111/j.1745-6916.2008.00063.x>
- Hamamura, T., Xu, Q., & Du, Y. (2013). Culture, social class, and independence–interdependence: The case of Chinese adolescents. *International Journal of Psychology*, 48(3), 344–351. <https://doi.org/10.1080/00207594.2011.647030>
- Handwerker, W. P. (2002). The construct validity of cultures: Cultural diversity, culture theory, and a method for ethnography. *American Anthropologist*, 104(1), 106–122. <https://doi.org/10.1525/aa.2002.104.1.106>

- Haslam, S. A., Jetten, J., Postmes, T., & Haslam, C. (2009). Social identity, health and well-being: An emerging agenda for Applied Psychology Abstract. *Applied Psychology*, 58(1), 1–23. <https://doi.org/10.1111/j.1464-0597.2008.00379.x>
- Hatiboğlu, N., & Habermas, T. (2016). The normativity of life scripts and its relation with life story events across cultures and subcultures. *Memory*, 24(10), 1369–1381. <https://doi.org/10.1080/09658211.2015.1111389>
- Heine, S. J. (2020). *Cultural psychology* (4th ed.). W. W. Norton & Company, Inc.
- Heintzelman, S. J., & King, L. A. (2014). Life is pretty meaningful. *American Psychologist*, 69(6), 561–574. <https://doi.org/10.1037/a0035049>
- Henry, P. J. (2009). Low-status compensation: A theory for understanding the role of status in cultures of honor. *Journal of Personality and Social Psychology*, 97(3), 451–466. <https://doi.org/10.1037/a0015476>
- Hill, K. (2009). Animal “culture”? In K. N. Laland & B. G. Galef (Eds.), *The question of animal culture*. Harvard University Press.
- Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed., pp. xiv, 303). Psychological Assessment Resources.
- Hopwood, C. J., Wright, A. G. C., & Bleidorn, W. (2022). Person–environment transactions differentiate personality and psychopathology. *Nature Reviews Psychology*, 1(1), Article 1. <https://doi.org/10.1038/s44159-021-00004-0>
- House, R. J. (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Sage.
- House, R. J., Dorfman, P. W., & Gupta, V. (2011). *Culture, leadership, and organizations: The GLOBE study of 62 societies* (5th printing). Sage.

- Humberg, S., Kuper, N., Rentzsch, K., Gerlach, T. M., Back, M. D., & Nestler, S. (2024). Investigating the effects of congruence between within-person associations: A comparison of two extensions of response surface analysis. *Psychological Methods*. <https://doi.org/10.1037/met0000666>
- Ishii, K., & Eisen, C. (2020). Socioeconomic status and cultural difference. In *Oxford research encyclopedia of psychology*. <https://doi.org/10.1093/acrefore/9780190236557.013.584>
- Johnson, T. P., Shavitt, S., & Holbrook, A. L. (2011). Survey response styles across cultures. In *Cross-cultural research methods in psychology* (pp. 130–175). Cambridge University Press.
- Jokela, M., Bleidorn, W., Lamb, M. E., Gosling, S. D., & Rentfrow, P. J. (2015). Geographically varying associations between personality and life satisfaction in the London metropolitan area. *Proceedings of the National Academy of Sciences*, 112(3), 725–730. <https://doi.org/10.1073/pnas.1415800112>
- Joshanloo, M. (2023). Within-person associations between subjective well-being and big five personality traits. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 24(6), 2111–2126. <https://doi.org/10.1007/s10902-023-00673-z>
- Judge, T. A., & Ferris, G. R. (1992). The elusive criterion of fit in human resources staffing decisions. *Human Resource Planning*, 15(4), 47–68. <https://go.gale.com/ps/i.do?p=AONE&sw=w&issn=01998986&v=2.1&it=r&id=GALE%7CA14605833&sid=googleScholar&linkaccess=abs>

- Kandler, C., Bratko, D., Butković, A., Hlupić, T. V., Tybur, J. M., Wesseldijk, L. W., de Vries, R. E., Jern, P., & Lewis, G. J. (2021). How genetic and environmental variance in personality traits shift across the life span: Evidence from a cross-national twin study. *Journal of Personality and Social Psychology*, *121*(5), 1079–1094.
<https://doi.org/10.1037/pspp0000366>
- Kandler, C., Kühn, S., Mönkediek, B., Forstner, A. J., & Bleidorn, W. (2024). A multidisciplinary perspective on Person-Environment Fit: Relevance, measurement, and future directions. *Current Directions in Psychological Science*, *33*(3), 198–205.
<https://doi.org/10.1177/09637214241242451>
- Kandler, C., & Rauthmann, J. F. (2022). Conceptualizing and studying characteristics, units, and fits of persons and environments: A coherent synthesis. *European Journal of Personality*, *36*(3), 293–318. <https://doi.org/10.1177/08902070211048728>
- Knezevic, G., Savic, D., Kutlesic, V., & Opacic, G. (2017). Disintegration: A reconceptualization of psychosis proneness as a personality trait separate from the Big Five. *Journal of Research in Personality*, *70*, 187–201.
<https://doi.org/10.1016/j.jrp.2017.06.001>
- Koenig, H., Parkerson, J., & Meador, K. G. (1997). Religion index for psychiatric research. *The American Journal of Psychiatry*, *154*(6), 885b–8886.
<https://doi.org/10.1176/ajp.154.6.885b>
- Krauss, S. (2006). Does ideology transcend culture? A preliminary examination in Romania. *Journal of Personality*, *74*(4), 1219–1256. <https://doi.org/10.1111/j.1467-6494.2006.00408.x>

- Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). lmerTest Package: Tests in linear mixed effects models. *Journal of Statistical Software*, 82, 1–26.
<https://doi.org/10.18637/jss.v082.i13>
- Lanning, K., Wetherell, G., Gardiner, G., Weston, S. J., & Condon, D. M. (2024). On person-community fit: Trait-, person-, and type-based approaches to measurement. *Current Research in Ecological and Social Psychology*, 6, 100180.
<https://doi.org/10.1016/j.cresp.2024.100180>
- Lareau, A. (2011). *Unequal childhoods: Class, race, and family life* (2nd ed.). University of California Press. <https://www.jstor.org/stable/10.1525/j.ctt1ppgj4>
- Lenth, R. V. (2021). *emmeans: Estimated marginal means, aka least-squares means [Manual]*.
<https://CRAN.R-project.org/package=emmeans>
- Leung, K., & Bond, M. H. (2004). Social axioms: A model for social beliefs in multicultural perspective. In *Advances in experimental social psychology, Vol. 36* (pp. 119–197). Elsevier Academic Press. [https://doi.org/10.1016/S0065-2601\(04\)36003-X](https://doi.org/10.1016/S0065-2601(04)36003-X)
- Leung, K., Bond, M. H., de Carrasquel, S. R., Muñoz, C., Hernández, M., Murakami, F., Yamaguchi, S., Bierbrauer, G., & Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology*, 33(3), 286–302.
<https://doi.org/10.1177/0022022102033003005>

- Levine, C. S., Miyamoto, Y., Markus, H. R., Rigotti, A., Boylan, J. M., Park, J., Kitayama, S., Karasawa, M., Kawakami, N., Coe, C. L., Love, G. D., & Ryff, C. D. (2016). Culture and healthy eating: The role of independence and interdependence in the United States and Japan. *Personality & Social Psychology Bulletin*, 42(10), 1335–1348.
<https://doi.org/10.1177/0146167216658645>
- Levine, T. R., Bresnahan, M. J., Park, H. S., Lapinski, M. K., Wittenbaum, G. M., Shearman, S. M., Lee, S. Y., Chung, D., & Ohashi, R. (2003). Self-construal scales lack validity. *Human Communication Research*, 29(2), 210–252. <https://doi.org/10.1111/j.1468-2958.2003.tb00837.x>
- Levinson, D., & Malone, M. (1980). Toward explaining human culture: A critical review of the findings of worldwide cross-cultural research. HRAF Press.
<https://cir.nii.ac.jp/crid/1130282272412448256>
- Lewin, K. (1936). *Principles of topological psychology* (pp. xv, 238). McGraw-Hill.
<https://doi.org/10.1037/10019-000>
- Lindeman, M., & Verkasalo, M. (2005). Measuring values with the Short Schwartz's Value Survey. *Journal of Personality Assessment*, 85(2), 170–178.
https://doi.org/10.1207/s15327752jpa8502_09
- Long, J. A. (2022). Comprehensive, user-friendly toolkit for probing interactions [Manual]. 2022. <https://interactions.jacob-long.com/>
- Lonner, W. J. (2011). The continuing challenge of discovering psychological “order” across cultures. In F. J. R. Van de Vijver, A. Chastiosis, & S. M. Breugelmans (Eds.), *Fundamental questions in cross-cultural psychology*. Cambridge-Hitachi.
<http://ebookcentral.proquest.com/lib/uoregon/detail.action?docID=691847>

- Maltseva, K. (2014). Normative culture, cultural competence and mental health in Sweden. *International Journal of Culture and Mental Health*, 7(2), 179–198.
<https://doi.org/10.1080/17542863.2013.765496>
- Markus, H. R., & Hamedani, M. G. (2019). People are culturally shaped shapers: The psychological science of culture and culture change. In *Handbook of cultural psychology* (2nd ed., pp. 11–52). The Guilford Press.
- Matsumoto, D. (2007). Culture, context, and behavior. *Journal of Personality*, 75(6), 1285–1320. <https://doi.org/10.1111/j.1467-6494.2007.00476.x>
- Matsumoto, D., & Hwang, H. C. (2021). Culture and psychology. In *The Oxford handbook of cultural neuroscience and global mental health*. Oxford University Press.
- Matsumoto, D., & Wilson, J. (2008). Culture, emotion, and motivation. In *Handbook of motivation and cognition across cultures*. Academic Press.
- Mc Breen, J., Di Tosto, G., Dignum, F., & Hofstede, G. J. (2011). Linking norms and culture. *2011 Second International Conference on Culture and Computing*, 9–14.
<https://doi.org/10.1109/Culture-Computing.2011.11>
- Meltzoff, A. N. (1988). Imitation, objects, tools, and the rudiments of language in human ontogeny. *Human Evolution*, 3(1–2), 45–64. <https://doi.org/10.1007/BF02436590>
- Menary, R., & Gillett, A. (2022). The tools of enculturation. *Topics in Cognitive Science*, 14(2), 363–387. <https://doi.org/10.1111/tops.12604>
- Merenda, P. F. (1997). A guide to the proper use of factor analysis in the conduct and reporting of research: Pitfalls to avoid. *Measurement and Evaluation in Counseling and Development*. <https://www.tandfonline.com/doi/abs/10.1080/07481756.1997.12068936>

- Miller, D. T., & McFarland, C. (1987). Pluralistic ignorance: When similarity is interpreted as dissimilarity. *Journal of Personality and Social Psychology*, 53(2), 298–305.
<https://doi.org/10.1037/0022-3514.53.2.298>
- Minkov, M., Vignoles, V. L., Welzel, C., Akaliyski, P., Bond, M. H., Kaasa, A., & Smith, P. B. (2024). Comparative culturology and cross-cultural psychology: How comparing societal cultures differs from comparing individuals' minds across cultures. *Journal of Cross-Cultural Psychology*. <https://doi.org/10.1177/00220221231220027>
- Morris, M. W., Hong, Y., Chiu, C., & Liu, Z. (2015). Normology: Integrating insights about social norms to understand cultural dynamics. *Organizational Behavior and Human Decision Processes*, 129, 1–13. <https://doi.org/10.1016/j.obhdp.2015.03.001>
- Na, J., McDonough, I. M., Chan, M. Y., & Park, D. C. (2016). Social-class differences in consumer choices: Working-class individuals are more sensitive to choices of others than middle-class individuals. *Personality and Social Psychology Bulletin*, 42(4), 430–443. <https://doi.org/10.1177/0146167216634043>
- Ojalehto, B. L., & Medin, D. L. (2015). Perspectives on culture and concepts. *Annual Review of Psychology*, 66(Volume 66, 2015), 249–275. <https://doi.org/10.1146/annurev-psych-010814-015120>
- Oyserman, D., & Yan, S. (2019). Making meaning: A culture-as-situated-cognition approach to the consequences of cultural fluency and disfluency. In *Handbook of cultural psychology* (2nd ed.). Guilford Publications.
- Ozer, D. J., & Benet-Martínez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, 57(1), 401–421.
<https://doi.org/10.1146/annurev.psych.57.102904.190127>

- Pavot, W., & Diener, E. (1993). Review of the Satisfaction With Life Scale. *Psychological Assessment*, 5(2), 164–172. <https://doi.org/10.1037/1040-3590.5.2.164>
- Pérez, J. (2020). *Bootstrapped White's test under the methodology of Jeong, J., Lee, K. (1999)*. <https://github.com/jlopezper/whitestrapp>
- Peterson, R. A. (2000). A meta-analysis of variance accounted for and factor loadings in Exploratory Factor Analysis. *Marketing Letters*, 11(3), 261–275. <https://doi.org/10.1023/A:1008191211004>
- Pollet, T. V., Stulp, G., Henzi, S. P., & Barrett, L. (2015). Taking the aggravation out of data aggregation: A conceptual guide to dealing with statistical issues related to the pooling of individual-level observational data. *American Journal of Primatology*, 77(7), 727–740. <https://doi.org/10.1002/ajp.22405>
- Rauscher, E. A., Schrodtt, P., Campbell-Salome, G., & Freytag, J. (2020). The intergenerational transmission of family communication patterns: (In)consistencies in conversation and conformity orientations across two generations of family. *Journal of Family Communication*, 20(2), 97–113. <https://doi.org/10.1080/15267431.2019.1683563>
- Rauthmann, J. F. (2021). Capturing interactions, correlations, fits, and transactions: A person-environment relations model. In *The handbook of personality dynamics and processes* (pp. 427–522). Elsevier Academic Press. <https://doi.org/10.1016/B978-0-12-813995-0.00018-2>
- Rentfrow, P. J. (2020). Geographical psychology. *Current Opinion in Psychology*, 32, 165–170. <https://doi.org/10.1016/j.copsyc.2019.09.009>

- Roberts, B. W., & Robins, R. W. (2004). Person-Environment Fit and its implications for personality development: A longitudinal study. *Journal of Personality*, 72(1), 89–110. <https://doi.org/10.1111/j.0022-3506.2004.00257.x>
- Rodseth, L. (1998). Distributive models of culture: A Sapirian alternative to essentialism. *American Anthropologist*, 100(1), 55–69. <https://www.jstor.org/stable/682808>
- Rokeach, M. (1973). *The nature of human values*. Free Press.
- Romney, A. K., Weller, S. C., & Batchelder, W. H. (1986). Culture as consensus: A theory of culture and informant accuracy. *American Anthropologist*, 88(2), 313–338. <https://www.jstor.org/stable/677564>
- Sagiv, L., & Schwartz, S. H. (2000). Value priorities and subjective well-being: Direct relations and congruity effects. *European Journal of Social Psychology*, 30(2), 177–198. [https://doi.org/10.1002/\(SICI\)1099-0992\(200003/04\)30:2<177::AID-EJSP982>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1099-0992(200003/04)30:2<177::AID-EJSP982>3.0.CO;2-Z)
- Saucier, G. (2000). Isms and the structure of social attitudes. *Journal of Personality and Social Psychology*, 78(2), 366–385. <https://doi.org/10.1037/0022-3514.78.2.366>
- Saucier, G. (2013). Isms dimensions: Toward a more comprehensive and integrative model of belief-system components. *Journal of Personality and Social Psychology*, 104(5), 921–939. <https://doi.org/10.1037/a0031968>
- Saucier, G. (2014). *Ethnonationalism: Concept and measurement* [Unpublished manuscript].
- Saucier, G. (2022). Culture, personality, and the psychology of religion. In *Culture, personality, and the psychology of religion*. Brill. <https://brill.com/display/title/63275>

- Saucier, G., Akers, L. G., Shen-Miller, S., Knežević, G., & Stankov, L. (2009). Patterns of thinking in militant extremism. *Perspectives on Psychological Science*, 4(3), 256–271.
<https://doi.org/10.1111/j.1745-6924.2009.01123.x>
- Saucier, G., Chen, Z., & Bettenhausen, C. (2014). *Machiavellianism: A brief measure of core components* [Unpublished manuscript].
- Saucier, G., Kenner, J., Iurino, K., Bou Malham, P., Chen, Z., Thalmayer, A. G., Kemmelmeier, M., Tov, W., Boutti, R., Metaferia, H., Çankaya, B., Mastor, K. A., Hsu, K.-Y., Wu, R., Maniruzzaman, M., Rugira, J., Tsaousis, I., Sosnyuk, O., Regmi Adhikary, J., ... Altschul, C. (2015). Cross-cultural differences in a global “Survey of World Views.” *Journal of Cross-Cultural Psychology*, 46(1), 53–70.
<https://doi.org/10.1177/0022022114551791>
- Schönbrodt, F., & Humberg, S. (2013). *RSA: An R package for response surface analysis (version 0.10.6)* [Computer software]. Institution: Comprehensive R Archive Network
Pages: 0.10.6. <https://CRAN.R-project.org/package=RSA>
- Schultz, L. (2016). *What does your major say about you? Selection, socialization, and person-environment fit in the context of personality development* [Masters, Washington University in St. Louis]. https://openscholarship.wustl.edu/art_sci_etds/981
- Schwartz, T. (1978). Where is the culture? Personality as the distributive locus of culture. In G.D. Spindler (Ed.), *The making of psychological anthropology*. University of California Press.
- Shen-Miller, S., Saucier, G., & Pan, H. (2013). *Seven types of materialism: Delineating a multifaceted construct* [Unpublished manuscript].

- Smelser, N. J. (1992). Culture: Coherent or incoherent. In *Theory of culture*. University of California Press.
- Sperber, D., & Claidière, N. (2008). Defining and explaining culture (comments on Richerson and Boyd, Not by genes alone). *Biology & Philosophy*, 23(2), 283–292.
<https://doi.org/10.1007/s10539-005-9012-8>
- Stankov, L., & Saucier, G. (2015). Social axioms in 33 countries: Good replicability at the individual but less so at the country level. *Journal of Cross-Cultural Psychology*, 46(2), 296–315. <https://doi.org/10.1177/0022022114558333>
- Stankov, L., Saucier, G., & Knežević, G. (2010). Militant extremist mind-set: Provioleence, Vile World, and Divine Power. *Psychological Assessment*, 22(1), 70–86.
<https://doi.org/10.1037/a0016925>
- Stephens, N. M., Fryberg, S. A., Markus, H. R., Johnson, C. S., & Covarrubias, R. (2012). Unseen disadvantage: How American universities’ focus on independence undermines the academic performance of first-generation college students. *Journal of Personality and Social Psychology*, 102(6), 1178–1197. <https://doi.org/10.1037/a0027143>
- Strong Jr., E. K. (1927). Vocational guidance of executives. *Journal of Applied Psychology*, 11(5), 331–347. <https://doi.org/10.1037/h0075674>
- Tanaka-Matsumi, J. (2001). Abnormal psychology and culture. In *The handbook of culture and psychology* (pp. 265–286). Oxford University Press.
- 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. <https://doi.org/10.1002/per.1969>

- 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. <https://doi.org/10.1037/a0024165>
- Triandis, H. C. (1995). *Individualism & collectivism* (pp. xv, 259). Westview Press.
- Triandis, H. C., & Gelfand, M. J. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality and Social Psychology*, 74(1), 118–128. <https://doi.org/10.1037/0022-3514.74.1.118>
- Tucker-Drob, E. M., & Harden, K. P. (2011). Early childhood cognitive development and parental cognitive stimulation: Evidence for reciprocal gene-environment transactions. *Developmental Science*, 15(2), 250. <https://doi.org/10.1111/j.1467-7687.2011.01121.x>
- Tzelgov, J., & Henik, A. (1991). Suppression situations in psychological research: Definitions, implications, and applications. *Psychological Bulletin*, 109(3), 524–536. <https://doi.org/10.1037/0033-2909.109.3.524>
- Vader, V., Markowitz, D. M., & Saucier, G. (2024). *Defining culture: A text analysis* [Unpublished manuscript].
- van de Vijver, F. J. R., Mylonas, K., Pavlopoulos, V., & Georgas, J. (2006). Results: Cross-cultural analyses of the family. In *Families across cultures* (pp. 126–185). Cambridge University Press. <https://doi.org/10.1017/CBO9780511489822.008>
- Vianen, A. E. M. van. (2018). Person–Environment Fit: A review of its basic tenets. *Annual Review of Organizational Psychology and Organizational Behavior*, 5 (Volume 5, 2018), 75–101. <https://doi.org/10.1146/annurev-orgpsych-032117-104702>
- Wallace, A. F. C. (1970). *Culture and personality* (2nd ed.). Random House.

- Weinberg, D., Stevens, G. W. J. M., Finkenauer, C., Brunekreef, B., Smit, H. A., & Wijga, A. H. (2019). The pathways from parental and neighbourhood socioeconomic status to adolescent educational attainment: An examination of the role of cognitive ability, teacher assessment, and educational expectations. *PLoS ONE*, *14*(5).
<https://doi.org/10.1371/journal.pone.0216803>
- Weston, S. J., Condon, D. M., Rentfrow, P. J., & Benet-Martínez, V. (2024). The person-environment fit of immigrants to the United States: A registered report. *Journal of Personality and Social Psychology*. <https://doi.org/10.31234/osf.io/f8msb>
- White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, *48*(4), 817–838. <https://doi.org/10.2307/1912934>
- Winzer, R., Vaez, M., Lindberg, L., & Sorjonen, K. (2021). Exploring associations between subjective well-being and personality over a time span of 15–18 months: A cohort study of adolescents in Sweden. *BMC Psychology*, *9*(1), 173.
<https://doi.org/10.1186/s40359-021-00673-9>
- Wood, D., & Furr, R. M. (2016). The correlates of similarity estimates are often misleadingly positive: The nature and scope of the problem, and some solutions. *Personality and Social Psychology Review*, *20*(2), 79–99. <https://doi.org/10.1177/1088868315581119>
- Zmigrod, L. (2022). A psychology of ideology: Unpacking the psychological structure of ideological thinking. *Perspectives on Psychological Science*, *17*(4), 1072–1092.
<https://doi.org/10.1177/17456916211044140>