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A systems perspective on human flourishing: Exploring cross-country similarities and differences of a multisystemic flourishing network

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ABSTRACT

A systems perspective explains dynamics of human flourishing based on the relations between its constituents. Using cross-sectional data from emerging adults (ages 18–29) in 10 countries ($N = 7221$), this study explored the interrelatedness among constituents of flourishing – happiness & satisfaction with life, mental & physical health, meaning & purpose, character & virtue, close social relationships, and financial & material stability – within and across countries. Each country's sample was characterized by a unique flourishing network, although there were similarities. Except for financial & material stability, all constituents were positively related across samples. Financial & material stability showed the highest cross-country heterogeneity in its relations. Happiness & satisfaction with life and meaning & purpose showed the strongest interrelations. A higher level of one constituent was associated with lower network connectivity. This systems perspective extends existing knowledge about the conceptualization of flourishing and how people can be supported to achieve and maintain complete well-being.

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Introduction

Human flourishing, or complete human well-being, might be understood as living in 'a state in which all aspects of a person's life are good' (VanderWeele, 2017, p. 8149). Reviewing past empirical studies and various theoretical considerations suggests that meaning and purpose in life, mental and physical health, happiness and satisfaction with life, close social relationships, and character and virtue are core constituents of flourishing, and that financial and material stability contributes to sustaining flourishing over time (VanderWeele, 2017). Most studies on well-being address only one or a narrow set of these flourishing constituents, which makes it difficult to ascertain the unique role of each constituent for the flourishing of humans without the presence of other central constituents (e.g., Kossakowski et al., 2017; Shiba et al., 2022). Moreover, even though measures have been developed to assess multiple constituents of flourishing, such as the Secure Flourishing Measure (VanderWeele, 2017) and the PERMA profiler

(Butler & Kern, 2016), the constituents are usually treated as independent (Heshmati et al., 2020). This independence implies that the constituents covary positively with one another because each is a measurable part of flourishing, a conceptualization known as the latent-variable model (Kan et al., 2020). Therefore, the latent-variable model indicates that flourishing is an accumulation of independent factors: if more are present and well developed, then one's state of flourishing should be higher. The constituents change because one's well-being is changing.

However, relying only on the latent-variable approach in research and praxis obscures the underlying complexity of flourishing, and a latent-variable model cannot fully explain why constituents of flourishing covary (Epskamp et al., 2018). Hence, recent empirical studies have complemented the conventional approach with a network model of flourishing (e.g., Heshmati et al., 2020; Kossakowski et al., 2017). This approach advocates the interdependence of flourishing constituents (e.g.,

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Kivi et al., 2021) so that a change in one aspect likely leads to a change in other aspects (Costantini et al., 2015; Epskamp et al., 2018). A network approach acknowledges that covariation among the constituents of flourishing signifies that they are related to flourishing, and emphasizes that the interplay between the constituents is also an essential part of understanding complete well-being (Costantini et al., 2015). Hence, the conventional approach is useful for studying how the theoretical construct of flourishing is manifested in praxis, how strongly each constituent contributes to flourishing, and how much the constituents covary due to a common cause, whereas the network model focuses on the unique relations between the constituents of flourishing and how their joint interplay achieves and maintains a status of complete well-being (Costantini et al., 2015; Epskamp et al., 2018). Taken together, an individual's state of flourishing should depend both on how developed each of these aspects of life are as well as the extent to which they are interrelated.

In order to better understand the notion of complete well-being from a systems perspective both for theoretical and practical reasons, the present study applies network analysis to cross-sectional data from 10 countries to explore (1) the general relations between core constituents of flourishing in different countries, (2) how the constituents are associated with each other, and (3) how the interrelatedness of the flourishing network changes when constituent values are lower versus higher.

Conceptual debates about flourishing

Before proceeding with empirical study of our systemic construct of flourishing as a set of mutually dependent constituents, it is helpful to situate this kind of construct within the broader scholarly debate about the meaning and scope of flourishing more generally. Following a normative approach, some have argued that there is a 'true essence' (Kristjánsson, 2015, p. 13) of flourishing beyond subjective emotions such as happiness. Briggs and Reiss (2021) would be squarely in this camp, as they argue that love provides the essential foundation for flourishing. But love itself has generally been studied empirically in prototypical rather than essential ways (Fehr & Russell, 1991; Heshmati et al., 2019). In other words, no single normative foundation or bedrock 'philosophical value commitments' (Margolis et al., 2020, p. 403) have emerged to guide the conceptualization and empirical study of love or flourishing, regular references to Aristotle or religious scriptures in some sub-fields notwithstanding (Briggs & Reiss, 2021; Messer,

2021; De Ruyter & Wolbert, 2020). In short, a well-ordered science of flourishing has yet to emerge (Lee et al., 2021). In the meantime, social scientists tend to follow the tradition established by Nietzsche, Wittgenstein, Husserl, Schutz, Foucault, and many others by approaching flourishing through a constructionist lens that takes it to be a cultural creation that derives its meaning from group-specific social interpretations. These cultural ideas vary substantially across historical time and geographic location and are promoted by distinct interpretive communities (Fish, 1980).

A related issue involves the extent to which flourishing is primarily a subjective experience or is based on objective criteria (De Ruyter & Wolbert, 2020). For those in the objectivist camp, flourishing should be based on one's objective contributions to society, independent of hedonic forms of happiness. A normative approach tends to favor objective goods, such as the practical wisdom necessary to make an objectively good contribution to society, as opposed to subjective feelings that may not be linked to the practice of virtue (Kristjánsson, 2015, 2018). But as with the normative foundations themselves, the objective-subjective divide is contested terrain.

The lack of a unified approach across and within disciplines has resulted in a disorienting proliferation of empirical measures, as well as ambiguity regarding how to synthesize or even reconcile disparate findings across studies (Hone et al., 2014; Lee et al., 2021). This lack of consensus among social scientists may reflect a more fundamental 'lack of philosophical clarity' (Haybron, 2016, p. 27), or it may reflect genuine philosophical differences. For example, some theorizing that derives from Aristotle advances an objective list view of flourishing on the grounds that all human beings, by virtue of their shared ontology, must develop specific capacities in order to function well and experience healthy growth. Conversely, a competing account privileges the subjective desires of individuals, consistent with the writings of Jacques Lacan, a radically different perspective. Some have argued that these lenses are complimentary and have developed a hybrid account that seeks to bridge the subjective and the objective (Kristjánsson, 2020; Lauinger, 2021).

The conceptual framework of flourishing used in this study might best be understood as a hybrid account, including collective, normative foundations as well as individual desires and appraisals. At a conceptual level, subjective appraisals of happiness and satisfaction with life are integrated with more objective concerns like physical health and good character. As a measurement tool, the survey items derived from VanderWeele's (2017) conceptual framework all involve subjective

appraisals (this is inherent in self-reports), but some of the domains, like health and character, could be corroborated by third-party, objective indicators such as life-span, clinical diagnoses, or the correspondence between personal behavior and external normative standards agreed upon by the larger community (for one partial example of such an integrative approach, see Bialowolski et al., 2021). Consistent with our contention that flourishing is a systemic construct comprised of a set of mutually dependent constituents, recent empirical work grounded in VanderWeele's (2017) conceptualization has found that the domains do predict each other over time (Chen et al., 2022). The question of which of these domains represent preconditions, constituents, or essential elements that constitute flourishing itself is not entirely clear in light of the disagreements about these terms within the literature (De Ruyter & Wolbert, 2020). It is our hope that the empirical findings reported herein will help inform this philosophical debate, as well as the other conceptual issues that we have briefly reviewed.

A systems perspective on flourishing: Relationality

The network model conceptualizes flourishing as a mereological, systemic construct in which flourishing is more than the sum of its parts (Schmittmann et al., 2013). This multisystemic network (or systems) approach is increasingly being applied in the social and behavioral sciences to enhance knowledge about various constructs, such as resilience (Höltge et al., 2020, 2021), quality of life (Kossakowski et al., 2017), and well-being (Heshmati et al., 2020; Shukla et al., 2022; Stochl et al., 2019). The systems approach emphasizes the interdependence of constituents over independence: the constituents of flourishing are theorized to influence both the state of one another at a given point in time and the development of each other over time. From this perspective, the constituents of flourishing might mutually hinder or foster each other, they could have no direct influence on each other but potentially indirect relations via other constituents, or they could show negligible relations (McNally, 2016).

Whereas past research and praxis have mainly focused on the level of flourishing constituents or overall flourishing, a systems perspective asks how the constituents are interrelated. This approach focuses on the system characteristics of flourishing, such as relational patterns and pathways between the constituents of the system, or which parts of a system exert especially high and low effects on other parts of the system (Burger et al., 2022). For example, for the planning of

interventions, it is useful to know which flourishing constituents have the most positive (spillover) effects on the other constituents and which constituents need to be targeted specifically because they might be independent of others. On the other hand, it is important to identify constituents of flourishing that could have a negative effect on other constituents in order to prevent negative spillover effects.

Previous network studies on well-being have shown that common constituents of well-being, including those found in the conceptual frameworks for the PERMA model (Heshmati et al., 2020), the Warwick-Edinburgh Mental Well-being Scale (Shukla et al., 2022; Stochl et al., 2019), or the Health-Related Quality of Life measure (Kossakowski et al., 2017), tend to be positively associated with each other. Thus, any constituent of well-being that is targeted by an intervention could reasonably be expected to positively affect other constituents. Studies that have investigated comparable well-being constituents have shown that hedonic forms of happiness, such as positive affect, generally seem to play an important role within the well-being network because they show many strong relations to other constituents (Heshmati et al., 2020; Shukla et al., 2022; Stochl et al., 2019). However, evidence from studies that have examined the well-being networks of samples from different countries suggests that the relations among flourishing constituents in one context may not be generalizable to other contexts (Shukla et al., 2022; Stochl et al., 2019).

Contextual and system-immanent determinants of system functioning

Socio-ecological theory states that an individual's well-being must be understood with respect to the higher-level contexts in which an individual is embedded, such as cultures, health care policies, or social networks (Bronfenbrenner, 1979). Hence, the interplay between constituents of flourishing can be expected to vary among individuals based on contextual factors that are not an immanent part of the flourishing network. For example, studies on resilience have shown that the structure and functioning of a resource network can vary by country (Höltge et al., 2020, 2021) or experienced adversity (Thoma et al., 2020). Similarly, psychopathological symptom networks have been shown to vary across countries (Fried et al., 2018) or overall severity of a psychopathology (Hakulinen et al., 2020). By studying how contextual factors shape the dynamics of a flourishing network, a more contextualized understanding of flourishing might emerge. Such insight

could inform the development and refinement of context-sensitive interventions oriented towards fostering and maintaining flourishing.

Additionally, in contrast to studying the effects of contextual variables on the interrelatedness of flourishing constituents, system-immanent constituents can also impact the status and relations among the rest of the constituents in the network (Jones, 2020). One of the key purposes of network modeling in the social sciences has been to identify influential components in a defined network. A change in the level of such influential components leads to likely changes in the level of several other network components, in an activating or deactivating manner (Robinaugh et al., 2017). Consequently, they may be considered important targets for intervention due to their likely spillover effects. Impactful components, however, are defined by how their level is associated with the relations between the other network components and can, therefore, lead to a significantly different structure and set of relations within a network (Jones, 2020). Hence, the status of an impactful constituent (i.e., low versus high levels of a constituent) can influence how other constituents are connected. Knowing these dynamics can provide insight into how the system will change and function if certain constituents are altered in praxis. So far, evidence along these lines has not been reported in research on well-being. Since positive psychological interventions are usually aimed at increasing human well-being, the question is how the flourishing network changes in reaction to such interventions. For example, the network might become more vulnerable to negative contextual influences if interventions lead to a higher interrelatedness of its constituents by increasing each constituent's status.

The present study

Traditionally, research and praxis have been interested in the overall state of well-being and its constituents, and intervened on them with the aim of changing their state in favor of higher well-being. A systems perspective on flourishing asks research and praxis alike to also account for the interrelatedness between these constituents. The emerging quest is to study how constituents need to work together for a state of complete human well-being and how different contexts shape these patterns. As a first step in this matter, cross-sectional, secondary data from studies that have applied the same multisystemic measure of flourishing (Secure Flourish Measure; VanderWeele, 2017) in different countries were used to explore the characteristics of a network of flourishing. The following research questions guided the analyses:

- (1) How are the constituents of flourishing generally related across countries?
- (2) Is there heterogeneity in the structure of the flourishing network across different countries?
- (3) How does the structure of the flourishing network differ at low versus high values of its constituents?

Materials and methods

Measure

The analysis was based on the Secure Flourish Measure (VanderWeele, 2017). The Secure Flourish Measure assesses six constituents of human flourishing via two items each: happiness & satisfaction with life (sample item: Overall, how satisfied are you with life as a whole these days?), mental & physical health (sample item: How would you rate your overall mental health?), meaning & purpose (sample item: I understand my purpose in life), character & virtue (sample item: I always act to promote good in all circumstances, even in difficult and challenging situations), close social relationships (sample item: I am content with my friendships and relationships), and financial & material stability (sample item: How often do you worry about safety, food, or housing?). Constituent scores are calculated by aggregating responses to the respective items. The first five constituents are seen as core constituents of flourishing (i.e., ends in themselves), and the financial & material stability constituent is seen as a means of sustaining these five core constituents over time. The measure is administered with item-specific, 11-point response scales (0–10). All 12 items can be summed for a total score, with higher values indicating higher secure flourishing. Reliability statistics for secure flourishing and each of its constituents by country can be found in Table S1. The estimated internal consistency of secure flourishing scores ranged from $\Omega = .69-.91$. The marginal, pairwise associations between the subscales for each country can be found in Table S2.

Procedure

A literature search was performed in July 2020 to identify published studies that had used the Secure Flourish Measure. Six published papers were found. We contacted the corresponding authors of the six publications and requested access to the datasets that were used. A total of 12 datasets from those publications were made available. Each author was also asked about whether they knew of any other unpublished datasets that contained the Secure Flourish Measure. Contact details for six principal investigators of other ongoing

research projects were obtained, and correspondence with each yielded a further seven relevant datasets. Overall, 19 datasets representing 10 countries were obtained from 8 different principal investigators. Datasets from the same country were merged. Even though the age of all received datasets combined ranged from 18 to 94 years, only emerging adults from 18 to 29 years of age (Arnett, 2016) were selected for the present analysis because it provided the largest sample size per country within a defined life period. Each dataset came from research projects that were granted ethical approval from an institutional review board within the country where each of the original studies was conducted.

Data analysis

The analyses were performed using *R* version 4.0.3 in *RStudio* 1.3.1095. The data are available upon request from the corresponding author.

Preliminary analysis

Following the procedure used in Kan et al. (2020), a first step was to identify which measurement model had the best fit to the Secure Flourishing Measure data in the entire sample. Three common latent-variable models of well-being (e.g., Goodman et al., 2018; Longo et al., 2020; Węziak-Białowolska et al., 2019) and a network model were compared: (1) a measurement, first-order model consisting of the six constituents of flourishing; (2) a bifactor model; (3) a hierarchical, second-order *g*-factor model; and (4) a network model. The results indicated that the network model had a significantly better fit to the data compared to all other models (see Table S2). These four models were replicated with the five core constituents of flourishing, as theory would predict that they should strongly covary (VanderWeele, 2017). Once again, a network model had a significantly better fit to the data (see Table S3).

Partial correlation networks

Generally, a network consists of nodes and edges that show relations between the nodes (Costantini et al., 2015). This study applied partial correlation networks, such that the nodes represent the six constituents of flourishing and the edges indicate significant conditional associations between these constituents. Hence, a partial correlation network indicates if a unique uni- or bidirectional relation exists between two flourishing constituents after controlling for the other constituents

within the network. A partial correlation network that is based on cross-sectional data provides insight into the valence and strength of relations among the constituents, which can be used to derive hypotheses about causal relationships (Fried et al., 2018).

Network estimation and comparison

Meta-analytic Gaussian network aggregation (MAGNA) was applied to study commonalities and peculiarities of each country's partial correlation network using *psychometrics* 0.0.8 (Epskamp et al., 2022). Generally, the main purpose of MAGNA is to explore the heterogeneity of the unique pairwise relations between a set of selected variables across different groups. In this study, we used MAGNA to test whether there are pairwise associations between any of the six constituents of flourishing that are significantly heterogeneous across the ten countries.

Two types of network models are included in the MAGNA analysis: saturated and pruned models (Epskamp et al., 2022). A saturated model is a fully connected model where all nodes are connected, even if a partial correlation is close to zero (Costantini et al., 2015). However, such a network might include many spurious edges between two variables because their pairwise relation might actually be explained, or mediated, via other variables. Hence, pruning can be used to identify and exclude spurious edges based on the standard errors of their respective parameters (Epskamp et al., 2022). A pruned network only includes edges that are significantly different from zero at $\alpha = .05$.

When conducting a MAGNA, four different models are usually estimated and compared: (1) each country has a unique network and only significant edges are included (the unique model with pruning), (2) the pairwise relations are not significantly different across countries and all relations are included (the constrained, multi-group saturated model), (3) the pairwise relations are not significantly different across countries and only significant relations are included (the constrained, multi-group model with pruning), and (4) some pairwise relations are equal across countries and some are specific to each country (the constrained, multi-group model with partial pruning). Hence, the first model assumes significant heterogeneity between the countries, and the other three models (so called fixed-effect MAGNAs) assume different degrees of homogeneity. A collection of model fit indices were used to select the best fitting model: two comparative fit indices, AIC and BIC; an absolute fit index, RMSEA (lower values indicating better

model fit); and four incremental fit indices, NFI, TLI, RFI, and CFI (higher values indicating better model fit).

If the unique (1) or partially pruned (4) model show the best fit to the data, a random-effects MAGNA can be used to estimate a common network model (Epskamp et al., 2022). A random-effects MAGNA estimates one common cross-country network and places a random effect on the common correlational structure of the network, providing some indication of the extent to which the pairwise associations among the flourishing constituents are heterogenous across countries. All networks were visualized using *qgraph* (Epskamp et al., 2012).

Network inference

Expected influence (EI) was computed using *qgraph* (Epskamp et al., 2012). EI estimates whether each flourishing constituent had an overall supportive (more positive than negative connections) or hindering (more negative than positive connections) association with other flourishing constituents (Robinaugh et al., 2016). It is the sum of all partial correlations of a constituent with all other constituents to which it is connected. The accuracy and stability analyses of EI can be found in the supplementary material (Figure S2 and S3).

Global strength impact (GSI) was used to show how much the structure of the flourishing network was dependent on the flourishing constituents themselves (Jones, 2020). The GSI of each flourishing constituent was derived using *networktools* (Jones, 2020). GSI provides an indication of how the direction (valence) and strength (weight) of a network's overall connectivity changes at low and high levels of a constituent. A negative GSI implies that the overall connectivity of the network decreases at high levels of a constituent, and a positive GSI implies an increase in overall network connectivity at high levels of the constituent. A permutation test was performed for each country to test if the global strength of the flourishing network differed significantly at low versus high values of each respective constituent. Hence, EI indicates the overall association of a constituent with its connected constituents, and GSI indicates how the associations between other constituents within the network vary based on low versus high levels of this constituent. Graphical representations of each country's network were produced using principal component analysis, and an eigenmodel for the common network model was estimated via *networktools* (Jones, 2020). These figures make it possible to interpret the placement of the nodes within a graph by potentially clustering nodes together into meaningful groups (Jones et al., 2018).

Results

Descriptive statistics

The overall sample consisted of $N = 7,221$ participants (60.7% female) with a mean age of 23.14 (range = 18–29; $SD = 3.39$) years. The sample size for each country ranged from $n = 318$ for India to $n = 1,891$ for United States of America (USA) (see Table 1). Most samples had a higher percentage of females. The sample that scored highest on secure flourishing was from Mexico, followed by Cambodia and then China. The samples with the lowest secure flourishing were from Ukraine, Indonesia, and South Africa.

Model fit

All incremental fit indices (NFI = .99, TLI = .99, RFI = .98, CFI = 1.00), the RMSEA (.03 [.02; .04]) and the AIC (107,499.07) favored the unique model with pruning over the others (see Table S4). The BIC favored the constrained, multi-group model with partial pruning (107,963.57), followed by the unique model with pruning (108,166.89). The unique model with pruning was chosen as the best fitting model, indicating that there is cross-country heterogeneity within the secure flourishing network that is not completely attributable to sample variations.

Next, a random-effects MAGNA was estimated to derive a common cross-country network and to gain insight into how much the associations differed across countries. Figure 1A shows that all estimated partial correlations were positive on average, and financial & material stability were not related to any of the other flourishing constituents. The strongest partial correlations across countries were between happiness & satisfaction with life and meaning & purpose (.43), followed by meaning & purpose and character & virtue (.26), and then happiness & satisfaction with life and mental & physical health (.25). The common cross-country network layout in Figure 1B shows that the five core constituents clustered together on one side of the graph, with financial & material stability situated by itself on the other side.

Figure 1C shows the estimated standard deviations of the random effects for the marginal correlations between the flourishing constituents. Estimates ranged from .06 (character & virtue with mental & physical health) to .25 (financial & material stability with happiness & satisfaction with life), and the average standard deviation was .13. The largest random effects were found for all associations involving financial & material stability. It had negative marginal correlations with all of the flourishing constituents to which it was connected in countries such as Cambodia and China, and positive marginal correlations with each of its connected flourishing constituents in

Table 1. Sample characteristics.

Country	Sample	N	Age [M (SD)]	Gender (%♀)	Happiness and			Financial and			
					Satisfaction with Life [M (SD)]	Mental and Physical Health [M (SD)]	Meaning and Purpose [M (SD)]	Character and Virtue [M (SD)]	Close Social Relationships [M (SD)]	Material Stability [M (SD)]	Secure Flourishing [M (SD)]
Cambodia	Factory workers	468	22.72 (2.54)	91.5	8.59 (1.53)	7.98 (1.88)	8.80 (1.35)	8.73 (1.41)	8.84 (1.46)	5.54 (3.21)	8.08 (1.10)
China	Factory workers	374	25.20 (3.06)	63.6	7.78 (1.96)	8.62 (1.57)	8.00 (1.81)	8.04 (1.96)	8.66 (1.64)	4.51 (3.28)	7.60 (1.10)
Colombia	University students; general population	1217	21.28 (2.69)	64.6	7.59 (2.09)	7.99 (1.98)	8.19 (2.96)	8.18 (1.84)	7.89 (2.20)	4.49 (3.20)	7.39 (1.56)
India	University students; general population	318	25.06 (2.78)	50.0	6.48 (2.14)	6.79 (2.17)	7.09 (2.07)	7.53 (1.90)	7.33 (2.17)	6.02 (2.47)	6.87 (1.68)
Indonesia	University students	450	19.50 (1.34)	81.7	6.34 (1.95)	5.81 (2.17)	6.81 (2.13)	7.44 (1.86)	6.82 (2.32)	5.97 (2.19)	6.53 (1.60)
Mexico	Factory workers	1,026	23.05 (3.53)	46.5	8.53 (1.87)	8.84 (1.49)	9.19 (1.49)	8.42 (1.75)	8.80 (1.88)	6.95 (3.05)	8.45 (1.09)
South Africa	General population	370	23.76 (3.30)	69.5	6.33 (2.47)	7.42 (2.24)	7.53 (2.18)	8.02 (1.93)	6.96 (2.41)	4.35 (2.89)	6.77 (1.60)
Sri Lanka	Factory workers	545	23.53 (3.20)	50.5	6.93 (2.76)	7.98 (2.11)	8.43 (2.11)	8.55 (2.05)	8.07 (2.47)	4.11 (3.30)	7.35 (1.45)
Ukraine	University students	562	20.99 (3.18)	69.0	6.55 (2.03)	6.33 (2.05)	6.79 (2.49)	7.02 (1.83)	6.97 (2.39)	5.40 (2.69)	6.51 (1.58)
USA	Employees; general population	1,891	25.04 (2.80)	54.1	7.20 (1.69)	7.16 (1.66)	7.19 (1.99)	7.76 (1.48)	7.19 (2.06)	5.96 (3.18)	7.08 (1.36)
Total		7,221	23.14 (3.39)	60.7	7.23 (2.12)	7.44 (2.04)	7.80 (2.13)	7.97 (1.81)	7.76 (2.23)	5.88 (3.16)	7.33 (1.53)

Note. Age range = [18, 29]. M = mean, SD = standard deviation, ♀ = female.

countries such as Ukraine and the USA. The five core flourishing constituents showed positive marginal correlations among each other in all countries.

Country-specific networks

Figure 2 presents the secure flourishing network of each country. The partial correlation between happiness & satisfaction with life and meaning & purpose was highest in most countries (e.g., China: .52, Cambodia: .50, Mexico: .49). There was little evidence of an association between financial & material stability and close social relationships as well as between financial & material stability and character & virtue in all countries. The partial correlations were mostly positive, suggesting potentially reciprocal, supportive influences in all countries. However, negative partial correlations were found between financial & material stability and happiness & satisfaction with life (China: $-.21$, Sri Lanka: $-.10$, Mexico: $-.06$, Cambodia: $-.06$) as well as between financial & material stability and mental

& physical health (China: $-.13$, Cambodia: $-.11$, Sri Lanka: $-.08$, Mexico: $-.06$), indicating hindering influences (i.e., an increase in one constituent is associated with a decrease in the other). Similarly, the partial correlation between financial & material stability and meaning & purpose was negative in Colombia ($-.05$).

Figure S1 shows the principal component analysis layout for each country, which generally align with the layout that was found for the common network (Figure 1A): one cluster for the core constituents and financial & material stability appearing separately.

Expected influence and global strength impact of the flourishing constituents

Figure 3A shows that happiness & satisfaction with life and meaning & purpose showed the highest average (positive) expected influence across the countries, such that they each had a generally supportive association with their connected flourishing constituents. According to

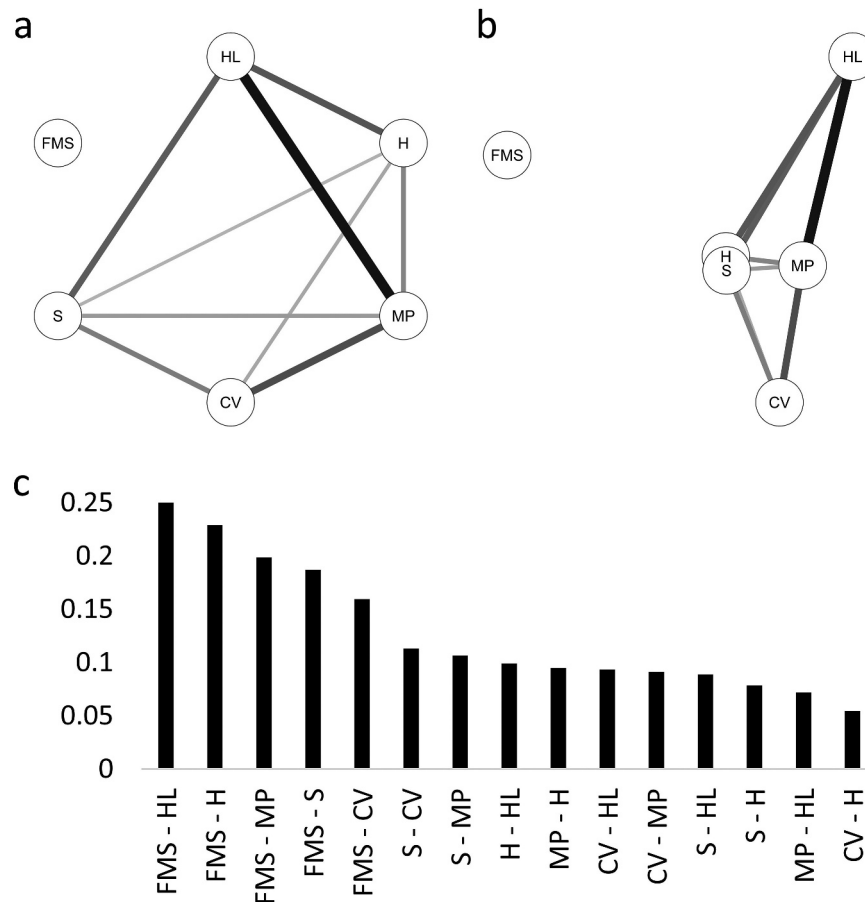


Figure 1. Common cross-country network structure. Note. (A) Circular layout to see relations between determinants. (B) Eigenmodel layout to indicate meaningful clustering of determinants. Edge thickness indicates edge weight, solid edges indicate positive partial correlations. (C) Estimated standard deviations of random effects of unconditional associations between the secure flourishing constituents. The larger the standard deviation of a random effect, the higher the heterogeneity of that association across countries. HL = Happiness and satisfaction with life; H = Mental and physical health; MP = Meaning and purpose; CV = Character and virtue; S = Close social relationships; FMS = Financial and material stability.

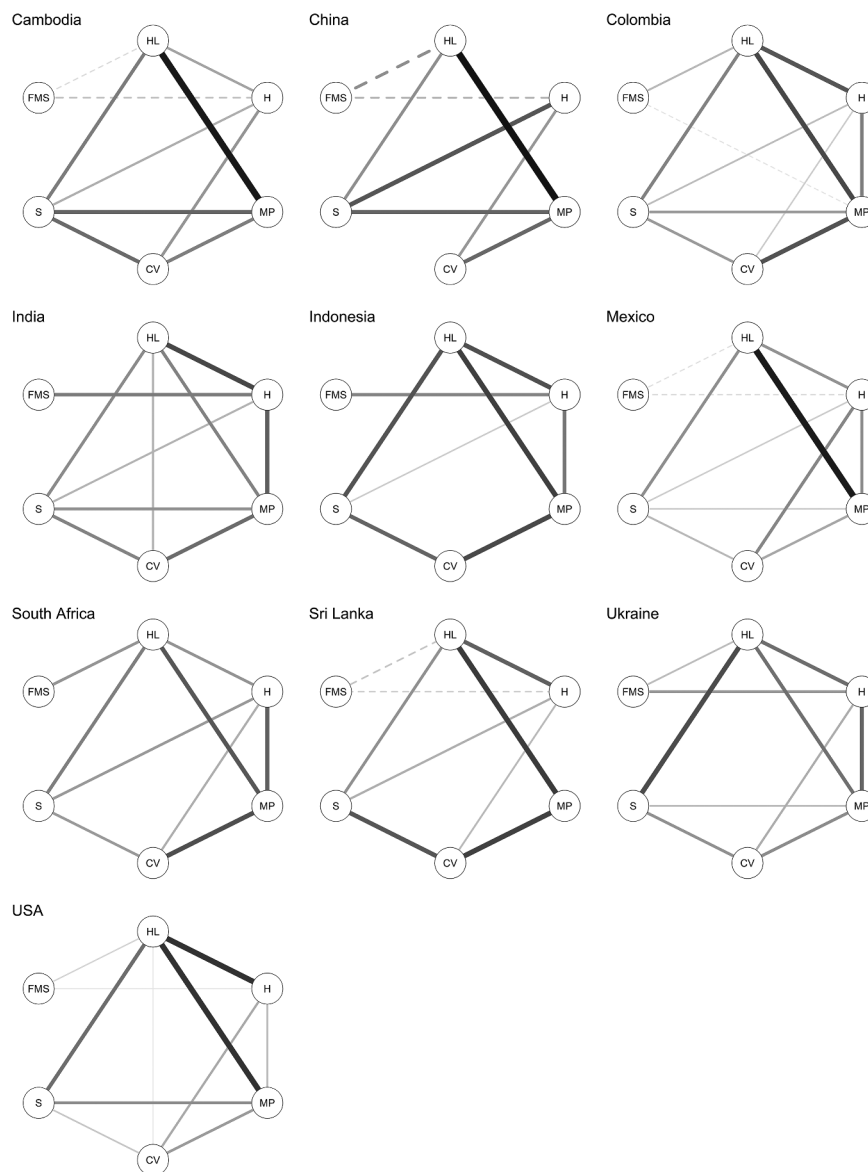


Figure 2. Unique networks for each country. Note. Edge thickness indicates edge weight, solid edges indicate positive partial correlations, and dashed edges indicate negative partial correlations. See Figure S1 for country-specific network layouts using principal component analysis. HL = Happiness and satisfaction with life; H = Mental and physical health; MP = Meaning and purpose; CV = Character and virtue; S = Close social relationships; FMS = Financial and material stability; USA = the United States of America.

Figures 1 and 2, this finding is partly due to the partial correlation between these two constituents of flourishing. Although the expected influence of these two constituents was similar in most countries, some countries also show pronounced differences. For example, happiness & satisfaction with life was highest in the USA (followed by meaning & purpose), whereas meaning & purpose was highest in Cambodia and China (followed by close social relationships and then happiness & satisfaction with life).

In accordance with Figure 2, financial & material stability showed overall hindering associations in Cambodia, China, Mexico, and Sri Lanka. However, it

had supportive associations in all other countries. Financial & material stability was also the constituent with the lowest expected influence in all countries.

The global strength impact of all flourishing constituents (i.e., the impact of a constituent on the interconnectivity between all other constituents in the network) showed almost the same pattern across samples, albeit with varying intensities (Figure 3B). A low level of a constituent was associated with a stronger interconnectivity between the other constituents, whereas a high level of a constituent was associated with a weaker

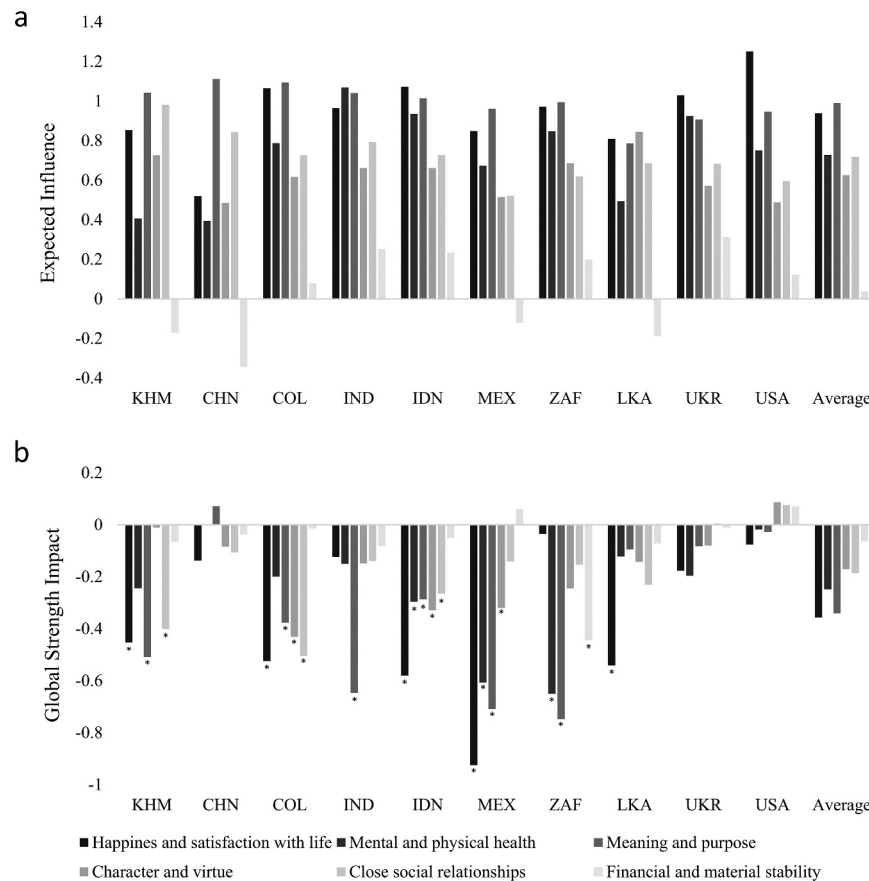


Figure 3. Network inferences. Note. (A) Profile of expected influence per country. (B) Profile of global strength impact per country. KHM = Cambodia; CHN = China; COL = Colombia; IND = India; IDN = Indonesia; MEX = Mexico; ZAF = South Africa; LKA = Sri Lanka; UKR = Ukraine; USA = United States of America.

interconnectivity between the other constituents. This indicates that the constituents of flourishing are most closely connected at low levels of all constituents, and are least connected at high levels of all constituents. On average, happiness & satisfaction with life, mental & physical health, and meaning & purpose showed the strongest impact. Countries that did not show any significant changes in global strength of the network based on low versus high levels of any constituent included China, Ukraine, and the USA.

Finally, a correlation between the expected influence and global strength impact of each constituent was estimated. This indicates whether the level of a constituent's influence is related to its level of impact, such as whether constituents with a weak influence also showed a weak impact. The results showed varying correlations across countries: Cambodia = .69, China = -.20, Colombia = .73, India = .46, Indonesia = .81, Mexico = .88, South Africa = .10, Sri Lanka = .43, Ukraine = .76, USA = .88. These findings suggest that a constituent's expected influence is not related to its global strength impact in every country.

Discussion

Understanding human flourishing not only requires researchers and practitioners to identify which aspects of human life are central for well-being, but also to determine how the constituents of flourishing work together and influence each other under different circumstances. This systems perspective conceptualizes flourishing as a network of interacting factors, emphasizing the interdependence of flourishing constituents. Using secondary, cross-sectional data from 10 countries, this study explored cross-country similarities and differences in the dynamics of a multisystemic network of flourishing that encompassed five core constituents of flourishing (i.e., happiness & satisfaction with life, meaning & purpose, mental & physical health, close social relationships, and character & virtue) and a sixth constituent (i.e., financial & material stability) that is considered important for sustaining the core constituents over time. Given that this study is based on cross-sectional data, the causal direction of relationships among the flourishing constituents can only be hypothesized (Fried et al., 2018).

Cross-country similarities

On average, most of the flourishing constituents were positively related with one another. The five core constituents clustered apart from financial & material stability, providing additional empirical evidence to suggest that the core constituents of flourishing are collectively important for well-being and that financial & material stability might be best represented as a means of potentially supporting these constituents over time (VanderWeele, 2017). Within this cross-country network, happiness & satisfaction with life and meaning & purpose shared the strongest positive relation with one another, and they were also the constituents with the strongest overall positive influence on the constituents to which they were connected. Nevertheless, the Secure Flourishing Measure may only include a selected set of possible flourishing constituents. Therefore, the findings of this study do not preclude the existence of other constituents of flourishing that could be important across contexts and cultures, as well as context-specific ones (Diener et al., 2010; Seligman, 2011).

Furthermore, the results indicated that happiness & satisfaction with life were not directly related to character & virtue in the combined sample as well as in each country. One potential explanation for this pattern of findings is that the relationship between these two constituents might be explained via other constituents, as each of these constituents showed moderate marginal relations with each other and to their connected constituents across countries. The findings also revealed that financial & material stability showed no evidence of association to any of the core constituents of flourishing in the combined sample. Taking the country-specific networks into account shows that in cases where this constituent did show relations with other constituents, such as mental & physical health and happiness & satisfaction with life, the associations were negative in some countries and positive in others. This variation across countries might have contributed to a nonsignificant effect in the combined sample. There was little evidence that financial & material stability was related to the close social relationships or character & virtue constituents in any country. It is possible that, in some countries, financial & material stability is only indirectly associated with one or both of these constituents via other constituents, whereas in other countries financial & material stability might simply be unrelated to the constituents of close social relationships and/or character & virtue. Taken together, these findings suggest that most of the core

constituents of flourishing included in this study are related to each other and are likely to reinforce one another within different countries.

Cross-country heterogeneities

The countries were best characterized by unique network structures, which was indicated by differences in the valence and strength of the relations among connected constituents. The relations that evidenced the lowest heterogeneity across countries were estimated between mental & physical health and character & virtue, followed by happiness & satisfaction with life and meaning & purpose. Happiness & satisfaction with life and meaning & purpose were among the top three constituents that had the most positive connections in the flourishing network in each country. Constituents that were particularly influential within certain countries included close social relationships in Cambodia and China, mental & physical health in India and Indonesia, and character & virtue in Sri Lanka.

The heterogeneity that emerged across the countries was especially due to how financial & material stability related to the five core constituents of flourishing. Although financial & material stability was associated with at least one core constituent in each country (mostly happiness & satisfaction with life, and to a lesser extent mental & physical health), the valence of those relations varied. For example, positive associations between financial & material stability and mental & physical health were found in India, Indonesia, and Ukraine, but negative associations were found in Cambodia, China, Mexico, Sri Lanka, and the USA. These findings suggest that financial & material stability may not always be positively associated with core constituents of flourishing, since they are potential means to acquire and maintain those, consistent with prior research that has found material wealth is not necessarily associated with higher levels of subjective well-being (Kahneman & Deaton, 2010). For example, samples from countries where financial & material stability was negatively associated with mental & physical health (i.e., Cambodia, China, Mexico, Sri Lanka) were comprised of participants who were (largely or entirely) labor-intensive apparel factory workers. Although those positions of employment might offer some level of financial & material stability, work-related demands could have negative effects on health that outweigh its benefits to financial & material stability. An alternative possibility is that some cultures might place a higher value on one or more core constituents of flourishing compared to financial &

material stability, which could lead to lower financial & material stability. For example, people who live in cultures that emphasize the importance of spending time with friends and family or serving people in their community might be less inclined to prioritize material goods or resources that could lead to a greater sense of financial & material stability.

The cross-country heterogeneity that was observed could also be due to the lower reliabilities of selected flourishing items in some countries. Lower reliability estimates indicate that the covariances among the items of a measure are weaker than measures with higher reliabilities. Hence, even though a constituent is important for an individual's flourishing, the components that comprise it might not be strongly related. For example, the lowest reliability for the happiness & satisfaction with life constituent was found in Sri Lanka. It is possible that the individual components of happiness and satisfaction with life do not strongly influence each other in Sri Lanka, even though both might still be important components of flourishing in that country. Another potential explanation could be that only certain components of a constituent might be important for an individual's flourishing within a particular context. For example, Ukraine had the lowest reliability for the character & virtue constituent. It could be that one component of the character & virtue constituent is more salient to flourishing in Ukraine, and therefore Ukrainians might emphasize or pursue that component over the other component. However, the Secure Flourishing Measure does not measure the cultural value of the constituents it assesses (VanderWeele, 2017), which could be integrated into future cross-cultural research on flourishing.

Finally, the impact statistics showed an almost coherent pattern in most countries: a higher level of a core constituent was associated with lower connectivity between the other constituents, whereas a lower level of that constituent was associated with higher connectivity. Nevertheless, not all constituents led to a significant change in the interconnectivity of the flourishing network in each country. For example, in China, Ukraine, and the USA, none of the constituents showed a significant impact on the interconnectivity of the other constituents. On average, the financial & material stability constituent was the least impactful, although it did have a significant impact in South Africa. This overall dynamic could be interpreted from the perspective of resilience because stressful circumstances are universal threats to human well-being (Ungar, 2018). A less connected flourishing network would limit negative spillover effects from one threatened or damaged constituent to its connected constituents. This can protect the

constituents of flourishing that are not directly affected by adversity and safeguard the system from an accelerated pattern of collapsing. On the other hand, this finding also suggests that a decline in an impactful constituent might increase the likelihood of the adversity affecting the entire system. Hence, individuals with a low flourishing status might show a higher susceptibility to positive as well as negative external influences through a stronger connected network compared to individuals with a high flourishing status and lesser connected network. People living in countries with more significantly impactful constituents could be at increased risk of experiencing these effects.

Theoretical implications

Theoretically, this study suggests that flourishing might be best understood as a system of interrelated constituents. Rather than conceptualizing flourishing merely as a set of different constituents that are central to human life, it also appears important to consider the reciprocal relations among the constituents of flourishing and the determinants of such reciprocity. If the constituents of flourishing influence one another, then a reasonable expectation is that changes in one constituent will evoke changes in other constituents via spillover effects and chain-reactions. Based on the findings that emerged for most countries, an individual may be closer to a state of complete well-being when the constituents of flourishing are weakly connected. In contrast, stronger connections between the constituents of flourishing might reflect a lower state of flourishing because there is a higher likelihood of negative spillover effects if constituents in the network are adversely affected or otherwise decline. However, this pattern of findings also points to the potential for flourishing to be more malleable when levels of the flourishing constituents are lower and therefore more highly interconnected. This theorizing requires rigorous testing through experimental and longitudinal studies, which will likely contribute to further enriching our understanding of flourishing as a dynamic system of interconnected constituents.

Practical implications

The findings of this study suggest that flourishing should be viewed as a state that is shaped by the dynamic interplay between its constituents within a particular context (Jones & Robinaugh, 2021). By applying a context-sensitive systems approach to flourishing that considers the mutual dependence of its constituents, this study's findings provide some indication of how the broad context in which people

live, such as country membership, could affect how the constituents influence each other. Based on the findings of this study, practitioners might generally expect positive spillover effects between the core constituents of flourishing across countries, even though countries might show different patterns of positive relations among the constituents. Hence, interventions to promote flourishing might consider first identifying and fostering the core constituent(s) of flourishing that have the most and strongest positive relations with other constituents, especially when limited resources are available for intervention activities. For example, meaning & purpose in life evidenced the most and strongest positive associations with the other core constituents in the largest number of countries, suggesting that this constituent may be a suitable target for resource-limited interventions aimed at promoting flourishing in different countries.

In addition, there may be a need to identify groups of individuals whose flourishing network is less versus more susceptible to external influences and to tailor their treatment accordingly. Our findings in many of the countries highlight the possibility of the flourishing network becoming more susceptible at lower levels of its constituents, which could have double-edged implications. On the one hand, timely interventions could be useful in preventing the onset of potential downward spirals through an increasing spread of negative influences throughout the flourishing network, especially for people who are faced with adversity and already have a lower level of flourishing. On the other hand, individuals with lower flourishing might benefit from potential positive spillover effects of interventions because the flourishing constituents are more highly interconnected. Those who have a less susceptible flourishing network might be less prone to network-wide changes than individuals with a more susceptible network, which means that they might need a treatment approach that deals with the flourishing constituents more individually.

Furthermore, a constituent that shares many and strong relations with other constituents may not necessarily be a constituent that has a significant impact on how strongly the constituents are connected as a whole. Although practitioners could expect that an influential constituent is also likely to be an impactful constituent in some countries, this may not be the case in other countries. Hence, practitioners might need to choose between targeting influential constituents to efficiently increase several constituents of flourishing at once and targeting impactful constituents to make the system less connected. These decisions would likely need to be informed by contextual particularities. For example, the

latter approach might be preferred in more adverse situations to make the flourishing network of individuals less vulnerable to disruption.

Finally, practitioners need to be aware that certain means, such as financial & material stability, may be necessary for people to reach and maintain a higher level of flourishing in one country but not in other countries. Hence, a one-size-fits-all approach to the promotion of flourishing may not be appropriate when working with individuals or groups with different socio-demographic characteristics.

Limitations and future research directions

Longitudinal and experimental studies that draw on a systems perspective to investigate the causal direction of relationships between the constituents of flourishing over time are warranted. This will also shed more light on the role of necessary means, such as financial & material stability, in supporting higher levels of core flourishing constituents over time. Second, even though this study investigated constituents that are theorized as being central to flourishing across contexts and cultures, future studies are encouraged to take potential context-specific constituents of flourishing into account. For example, religion/spirituality is a central aspect of human life in societies all over the world (Cowden et al., [in press](#)), and it would be imperative to measure it when studying their flourishing (VanderWeele, 2020). Other potential core constituents of flourishing from other established well-being models, such as the PERMA model (Seligman, 2011) or the Flourishing Scale (Diener et al., 2010), could also be included in network analysis studies to develop a more comprehensive understanding of flourishing. Third, our network analytic findings for the combined sample may not be generalizable beyond the group of countries that were examined in this study. As we observed, the pattern of interrelations among the constituents of flourishing can vary considerably across countries, pointing to the importance of applying a systems lens to flourishing that is sensitive to context. In addition, the samples of each country consisted of young adults aged 18 to 29 years. Further work is needed to determine whether the networks of flourishing that emerged in this study (both within each country and the combined sample) generalize to older adults. Future studies should aim at larger, nationally representative sample sizes to improve the generalizability of the results to the broader population. However, even nationally representative

data has its drawbacks because central aspects of human life can differ between communities of multicultural countries like the USA, and are continuing to evolve through global migration. Hence, future cross-country studies could consider purposefully selecting communities based on similar sociodemographic characteristics, which might afford greater insight into cross-cultural similarities and differences in flourishing. Finally, additional research is needed to determine if this study's finding about the impact of the flourishing constituents on the connectivity of the flourishing network replicates in other samples, and to more rigorously explore whether individuals with higher flourishing are less susceptible to the influence of negative and positive experiences because their network of flourishing constituents is less interconnected.

Conclusion

The flourishing of an individual has traditionally been represented as the aggregation of their functioning across different salient aspects of human life. In this study, we applied a systems perspective to characterize and evaluate flourishing as a multisystemic network of interconnected, interdependent constituents whose relations can show similarities as well as differences across contexts. Although we found similarities across countries, the findings indicated that flourishing might be best characterized by a unique network of interrelated constituents within each country. There was also evidence to suggest that the constituents of flourishing might shape how the other constituents of flourishing are associated with one another. If future theory and research can account for the relational patterns between the constituents of flourishing, our understanding of flourishing and capacity to promote complete well-being could be greatly enhanced.

Disclosure statement

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