Psychology of Aesthetics, Creativity, and the Arts

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There is substantial interest among psychologists in the psychological processes of engaging arts and humanities. Despite this, there is still a need for methodological tools to investigate the psychological mechanisms through which engagement in arts and humanities enhances individual well-being. Using four rounds of data collection (including one retest), we document the development and validation of the scales measuring each of the five theorized mechanisms: reflection, acquisition, immersion, socialization, and expression. Using exploratory and confirmatory factor analyses, we found a three-factor structure for reflection (life/worldview, emotional, and external), and six-factor for acquisition (vicarious experience, direct encouragement, social persuasion, experience of mastery—ability, experience of mastery—success, and positive physiological response), two-factor structure for immersion (effort and passage of time), three-factor for socialization (relationships, identity, conversation), and one-factor structure for expression. We also reported measurement invariance in mechanisms of engagements in arts vs. humanities and between males and females and over time. The measure demonstrated predictive and concurrent validity for flourishing outcomes, good test–retest reliability, and measurement equivalence across gender, between arts and humanities, and over time.

Keywords: scale development, arts, humanities, well-being

Supplemental materials: https://doi.org/10.1037/aca0000556.supp

Arts and humanities play a significant part in human development and experience. Children are socialized through stories, songs, movies, and progress through formal education in literature, music, history, and performing arts. Continuing through adulthood, people across diverse backgrounds and cultures find influences of arts and humanities in education, leisure, and work. They can appreciate them for their intrinsic value and the personal enrichment they bring, and the social bonds they create among community members (Vaziri et al., 2019). As a result, there has been a century of psychological scholarship devoted to the process of engagement with the arts (Teo, 2017) and, more recently, the humanities. For example, several divisions of the American Psychological Association such as the Society for the Psychology of Aesthetics, Creativity and the Arts (Division 10); the Society

for Theoretical and Philosophical Psychology (Division 24); the Society for the Psychology of Religion and Spirituality (Division 36) along with their accompanying peer-reviewed journals have been devoted to the promotion of scholarship in this area (Shim et al., 2019).

Extant research from varied disciplines suggests that engagement with arts and humanities (AH) can lead to positive well-being outcomes. It includes an increase in positive affect, decrease in negative affect, higher psychological well-being, and positive health outcomes (Baumann et al., 2013; Sonke et al., 2015; Tymoszuk et al., 2020; Wheatley & Bickerton, 2017). As a result, there have been multiple investigations into arts-related interventions which have led to improvements in education (e.g., Aaron et al., 2011), workplace (e.g., Karpavičiūtė & Macijauskienė, 2016), and health-related contexts (e.g., Ford et al., 2018). Similarly, meta-analyses have found that humanities-related activities such as reading fiction lead to better psychological outcomes in both correlational (Mumper & Gerrig, 2017) and experimental studies (Dodell-Feder & Tamir, 2018). Overall, engagement with both the arts and humanities (such as time spent reading, listening to music, and attending cultural events) is positively associated with greater well-being outcomes (Vaziri et al., 2019; Wang & Wong, 2014).

While extant empirical work suggests that engagement in AH leads to human flourishing, there is still a need for empirical investigation on how and why they do so. In other words, we need to understand the cognitive, affective, behavioral, and social

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processes through which engagement in AH can flourish human well-being (Tay et al., 2018; Vaziri et al., 2019). To address this issue, Tay et al. (2018) proposed a conceptual model connecting engagement in AH to a range of human flourishing outcomes through four mechanisms: immersion (feelings of high interest and absorption), embeddedness or acquisition (motivated involvement through encouragement, sense of mastery, or past experiences), socialization (social bonding through engagement), and reflection (internal motivation to investigate and shift own identity). Further, AH also allows people to express themselves through their activities, which can function as another mechanism—one of expression. Therefore, engagement in AH can lead to greater well-being by providing rich, immersive experiences where one can socialize, reflect, and express themselves, and subsequently provide them with skills that contribute to their flourishing.

The goal of this article is to develop and validate the scales to capture these key mechanisms leading from engagement in AH to flourishing. We first deductively generate items for each mechanism through initial theoretical definition of each construct and its dimensions, and then empirically reduce and refine the items and factor structure for each scale. Additionally, we sought to examine whether these mechanisms are similar across arts and humanities, and whether this psychological framework applies across demographic groups (e.g., gender) and over time through conducting tests of measurement equivalence. Finally, we aimed to test whether these AH mechanisms lead to greater well-being by documenting the validity of these scales in predicting different well-being outcomes concurrently and longitudinally.

Mechanisms of Arts and Humanities

We propose five mechanisms, namely RAISE (reflection, acquisition, immersion, socialization, and expression) through which engagement in AH may lead to positive well-being and flourishing outcomes. Below, we detail how engagement and involvement in activities involving art and humanities can affect individual well-being through these mechanisms.

Immersion

Engagement in AH can be beneficial through the immersive nature of the activity. The immersion mechanism represents attention captured during engagement in AH, potentially resulting in a feeling of "being carried away" or in its ideal form, an experience of "flow." Immersive experiences of this sort have been related to positive physiological and psychological reactions (Fritz & Avsec, 2007; Hallam et al., 2014). In particular, such immersive experiences can derive affective states such as awe (Busch & Gick, 2012; De Bolla, 2003), and can also lead to greater in-the-moment sensory experiences (Csikszentmihalyi, 1990). Immersion in music serves as an example for various modes and media, which can promote "visual imagery, rhythmic entrainment, expectancy-related arousal, emotional contagion, and triggering of autobiographical memories" (Rickard, 2014). Similarly, according to transportation theory, immersion in texts and stories can result in deep enjoyment that may lead to self-transformation and can influence our subsequent interaction with and judgments of the world (Gerrig, 1993; Green et al., 2004).

Dimensions

We theorized that immersion contains three dimensions: the passage of time, effortless involvement, and loss of self-consciousness. Passage of time dimension represents experiences where one may be so immersed in their activity that they lose track of time, subsequently leading to greater in-the-moment sensory experiences (Csikszentmihalyi, 1990). Similarly, immersion can also include the experience of losing themselves in an activity that feels effortless and, therefore, find such experiences desirable. Such absorption can also enhance individual flourishing directly through positive psychological and physiological reactions. For instance, research suggests that people immerse in music and such immersion can be useful for emotional regulation (decrease negative affect and increase positive affect) (Saarikallio & Erkkilä, 2007). Immersion in pleasant music has been found to raise dopamine levels and activity in brain areas associated with pleasure and reward (Menon & Levitin, 2005; Salimpoor et al., 2011). At the same time, immersion also involves the experience of a "loss of reflective self-consciousness" (Nakamura & Csikszentmihalyi, 2009). For instance, those who are fully concentrating on a story or a piece of art may not notice events around them, including one's worries or concerns (Green et al., 2004). Such loss of preoccupation of the self may then lead to self-transcendence by broadening their experience (Nakamura & Csikszentmihalyi, 2014), which could ultimately enhance human flourishing.

Acquisition

Another mechanism through which engagement in AH can lead to flourishing is through the acquisition of skills, or experience of skill development. The psychological processes of acquisition which underlie the development of particular perspectives, habits, or skills have been extensively theorized by Bandura's social-cognitive theory (cf. Bandura, 1986). Prior research has shown that these processes can result in higher self-efficacy (Bandura, 1997), self-regulation (Carver & Scheier, 1998), emotion regulation (Gross, 1998; Gross & Thompson, 2007), integrative complexity (Driver & Streufert, 1969), hope (Snyder, 1994), and feelings of autonomy, relatedness, and competence (Deci & Ryan, 2000; Ryan, 1995), demonstrating a link to human flourishing.

Dimensions

People can develop their skills in the arts and humanities through process of mastery, direct encouragement, vicarious experiences, and positive physiological responses during their experience which can ultimately raise their self-efficacy (Maddux, 2002), help them embed themselves in the activity further, and as a result, benefit from their competence and involvement (Tay et al., 2018). Therefore, while we initially proposed an all-encompassing one-factor structure for acquisition, we later theorized a four-factor structure (mastery, direct encouragement, vicarious experiences, and positive physiological responses) based on socio-cognitive processes that underlie practice, learning, and cultivation (Maddux, 2002). Acquisition can be in the forms of mastery: for instance, when a dancer experiences greater mastery of their craft, they may spend more quality time practicing the craft (for instance, deliberate practice: (Ericsson et al., 1993)) and more enjoyment and flourishing due to such endeavors. Similarly, people may feel

reinforced when they receive direct encouragement for their artistic or humanities-related endeavors (Oreck, 2004) and subsequently are likely to engage in more related activities. Another way through which participants may also develop their skills is through observation of others who engage in the same activities (Bandura, 1986, 2018). For instance, many artists watch masters in their craft in order to improve and mimic their actions (e.g., visiting art museums; Cotter & Pawelski, 2022) and may even foster self-efficacy through the process of vicarious experience (Kardas & O'Brien, 2018). Finally, they can also receive positive in-the-moment physiological feedback that encourages them to continue their habit. For example, when people are reading or listening for pleasure (i.e., they get positive in-the-moment experience during their artistic or humanities-related engagement), they are more likely to repeat the activities and also, benefit from positive well-being outcomes (Morinville et al., 2013). All these experiences provide intrinsic or extrinsic motivation and higher self-efficacy to seek out AH-related activities, further their craft actively, and subsequently, benefit from them.

Socialization

Engagement in AH can have a significant social component, whether intended or not. In fact, the reported positive outcome of different forms of art interventions was social: sense of belonging and community (Shim et al., 2021). Some research suggests that artistic endeavors are a part of an evolutionary mechanism for creating and maintaining social ties within humans (Pearce et al., 2015). Arts and cultures can bring a variety of beliefs and perspectives to the individual, either from within a community or across different cultural environments. Through socialization, AH can enhance empathy (e.g., reading fiction: Kidd & Castano, 2013), creative outcomes (Tadmor et al., 2012), and broaden cognitive and emotional experiences through novel encounters (Armitage, 2013). Further, it can enhance individuals' emotional repertoire, just as exposure to emotional episodes can serve to induct children into an emotional culture (Gordon, 1989). Therefore, engagement in the arts and humanities can afford opportunities to develop social bonds, such as opportunities to engage with people along with means to understand others (e.g., increase empathy or theory of mind (Mumper & Gerrig, 2017); mentalizing, perspective-taking, and emotion identification (Dodell-Feder & Tamir, 2018).

The socialization mechanism therefore includes relational aspects of engagement such as social bonding or relationships and conversation. Research has shown that the development of social relations itself has beneficial health (Tay et al., 2013) and well-being effects (Tay & Diener, 2011). Related to positive normative outcomes, greater levels of trust and interpersonal accountability can also promote positive conduct and pro-sociality (e.g., Colquitt et al., 2007). In addition, socialization also reflects the degree to which individuals take on various roles and identities within communities and cultures. Identity is a function of social roles (Roberts & Donahue, 1994) and, therefore, broadening these roles is closely tied to the formation of new identities, which can serve as psychological resources for buffering stress (Thoits, 1983). The accumulation and diversification of social roles (e.g., artist, actor) can enhance individual lives through participation in new life activities (e.g., art, acting) and new networks of friends and community members.

Dimensions

We, therefore, theorize three dimensions for socialization: relationships and conversations, identity, and identification. People bond with others who engage in similar activities—readers form a book club, musicians create and perform music together, and artists coalesce in exhibitions. They converse together, share resources and enjoyment, and subsequently fuse their engagement in AH with social bonding. Based on Roberts and Donahue's (1994) work on self-concepts across social roles, and more broadly identity theory (Burke & Stets, 2009), we argue that individuals could engage with AH through a process of identity formation through social influences which we label as identification. In addition, engagement in the arts, music, and literature in ways they influence their identity may also perhaps benefit the individual through social mobility (e.g., through participation in high-prestige activities such as an opera or art exhibits) which we label identity.

Reflection

Engagement in AH can reveal insights into the desirable or undesirable parts of self, motivate one to change oneself, and facilitate the means of doing so. As such, the reflection mechanism represents an intentional, cognitive-emotional process for developing, reinforcing, or discarding one's habits, character, values, or worldview. Reflection through engagement in AH can promote critical thinking and perspective taking (Batson et al., 1997; Galinsky & Moskowitz, 2000), resulting in an evolution of the self and enhanced meaning and purpose (Korn, 1985). Reflection can also develop a greater moral compass (Kohlberg, 1984) and the questioning of current social practices, triggering civic engagement and social change (Catterall et al., 2012; Hunter & Mohammed, 2013; Nussbaum, 2010). All in all, engagement in AH may lead individuals to be more reflective about their own identity, values, and beliefs, foster changes in psychological richness and greater perspective-taking, and subsequent better social interactions with others.

Dimensions

Since reflection features reflect a process for developing, reinforcing, or discarding one's thoughts, values, and worldview about either internal (self or life and worldview) or external objects (others), we propose three factors of reflection mechanism concerning these three subjects: internal-focused thoughts, feelings, and behaviors of self; internal focused thoughts about life or worldview; and external-focused thoughts, feelings, and behaviors of others. First, reflection can be in the form of internal reflection about different aspects of their life, which can function as an impetus for profound change: engagement in AH can lead to this type of reflection. Similarly, engaging in varying sources of arts and humanities—for example, reading different philosophical or fictional books or watching theater—can also lead one to reflect on the state of the world and explore philosophical questions of life. One can also reflect on other people's thoughts and perspectives, leading one to see the world and other people from new perspectives. Engagement in AH can therefore affect individual perspectives and well-being through these three dimensions of reflection.

Expression

In addition to these four mechanisms proposed by Tay et al. (2018), we added expression as a fifth means through which AH can enhance well-being. One crucial characteristic of AH is that it can provide an opportunity for individuals to express themselves in creative and novel ways, which can subsequently influence individual flourishing. Art and humanities have been used as means to express emotions that are difficult to communicate in therapy (e.g., art therapy: Hosea, 2006; Puig et al., 2006), creative arts (Emunah, 1990), performing arts (Álvarez et al., 2010), music (Wöllner, 2012), and writing (Pennebaker, 1997, 2018). These experiences subsequently have beneficial effects on their subjective well-being (Pennebaker, 1997, 2018), positive physical and health behavior (Travagin et al., 2015), and positive outcomes such as empathy (Wöllner, 2012).

Dimensions

Therefore, expression is a mechanism through which individuals can express themselves in their activity (Cameron & Nicholls, 1998), as well as use AH as an emotional regulation tool (Lu & Stanton, 2010). We theorize that expression is a single-factor construct and represents actions or experiences where people can disclose their feelings, vent, and communicate their thoughts through their involvement in the AH.

Mechanisms of Engagement in the Arts and Humanities Scales

Our focus for the remainder of this article is on the development and validation of the Mechanisms of Engagement in the Arts and Humanities scales. Building on the theoretical work on the mechanisms of engagement, we created a large pool of scale items for each identified mechanism and then reduced the number of scale items through an initial data collection (using Group 1 sample). We improved upon the finalized scale by adding and further refining the items (Group 2a) and finalizing our scales. We then validated the scale structure (using Group 3) and examined the scale properties including test–retest reliability, measurement equivalence, and predictive validity for well-being outcomes (Group 2b). In terms of well-being outcomes, we focused on psychological competencies, general well-being, and normative outcomes, as defined in Tay et al.'s (2018) conceptual framework.

Method

Participants

Three groups of U.S. participants from Amazon Mechanical Turk were recruited to participate in the current research: one of them was retested after 2 months for a follow-up study. Details of their demographic information for each sample are in Table 1. We recruited participants with over 95% approval rating, incorporated six attention questions in the survey, and excluded those who missed more than one of these questions.

Group 1. In Group 1, we recruited 500 U.S. participants through Amazon Mechanical Turk. After removing those who failed more than one attention check questions, we had a sample size of 357.

Group 2a. Five hundred participants were recruited through Amazon Mechanical Turk. After the same attention check procedures as Group 1, the final sample size was 443.

Group 2b. We ran a follow-up study with the same participants as Group 2a after two months. Of the 443 participants in Group 2a, 271 subjects responded. After removing participants who failed any attention check, our final sample size was 260.

Group 3. To validate the scale, we collected data from 295 participants. After removing participants who failed more than two attention check questions, our final sample size was 239.

Outcome Measures

We included a comprehensive list of outcomes that have been linked to the AH in past literature (Tay et al., 2018), particularly focusing on flourishing—the cultivation of strengths, meaning, and positive states and traits (Cotter & Pawelski, 2022). We used the Tay et al. (2018) framework to measure flourishing outcomes we expect engagement in the AH to affect: (a) general well-being such as high positive emotion, fewer negative emotion, higher overall life, and life domain evaluation (Positive and Negative Affect Scale, Comprehensive Inventory of Thriving (CIT), Job satisfaction, Work–Life Balance Scale, and Meaning in Life Questionnaire), (b) psychological competencies such as greater creativity and curiosity (Curiosity Exploration Inventory), and (c) positive normative outcomes such as character, values, civic engagement, and morality (Civic engagement scale, Perspective taking, and Empathetic Concern from Interpersonal Reactivity Index). The study of Tay et al. (2018) contains the full discussion of the theorized effects of engagement in the AH on flourishing outcomes and full range of the outcomes. Table 2 lists all of the flourishing outcome measures used in this study, along with example items and reliability (coefficient alpha).

Study Procedure

Respondents were recruited from Mturk and were asked to fill out a questionnaire containing the items developed for the study, along

Table 1
Demographic Characteristics by Sample

Demographic	Group 1	Group 2a	Group 2b	Group 3
Total sample	357	443	260	239
Gender	51% female	47% female	46% female	59% female
Age	$M = 37$ years	$M = 36$ years	$M = 37$ years	$M = 34$ years
Race	80% white	75% white	77% white	81% white
Relationship status	55% married	50% married	52% married	78% married
Employment status	72% full-time employed	68% full-time employed	69% full-time employed	76% full-time employed

Table 2

Full List of Flourishing Outcomes Along With Description and Coefficient Alpha

Flourishing outcome measures	Items	Description	α
CIT (Su et al., 2014)	54	An 18-factor measure of holistic positive functioning. Example item: "My life is going well."	.95
MLQ (Steger et al., 2006)	10	A measure of presence of and the search for meaning in life. "My life has a clear sense of purpose."	.80
Civic Engagement Scale (Doolittle & Faul, 2013)	14	A measure of civic-minded attitude and behavior. "I feel responsible for my community" or "I participate in discussions that raise issues of social responsibility.	.95
Curiosity Exploration Inventory (Kashdan et al., 2009)	10	A measure of trait curiosity "I frequently seek out opportunities to challenge myself and grow as a person."	.91
Work–Life Balance Scale (Valcour, 2007)	10	Measure of level of satisfaction with work–family balance. For example, satisfaction with "the way you divide your time between work and personal or family life."	.97
Job Satisfaction (Seashore et al., 1982)	3	Michigan Organizational Assessment Questionnaire about individual job satisfaction. For example, "All in all I am satisfied with my job.".	.98
Positive Affect (PANAS) (Watson et al., 1988)	4	Excited, enthusiastic, inspired, and determined	.89
Negative Affect (PANAS) (Watson et al., 1988)	3	Distressed, inspired, determined	.91
IRI (Davis, 1980, 1983; Pulos et al., 2004).	14	A measure of perspective taking using two sub-scales of IRI: PT and EC For example, PT: "Before criticizing somebody, I try to imagine how I would feel if I were in their place." For example, EC: "I am often quite touched by things that I see happen."	.91

Note. CIT = Comprehensive Inventory of Thriving; MLQ = Meaning in Life Questionnaire; IRI = Interpersonal Reactivity Index; PT = Perspective Taking; EC = Empathetic Concern.

with a variety of well-being measures. The order of the questions was randomized within and across constructs. We also randomly selected whether participants responded to the arts- or humanities-related questions first. The participants were allowed to mark unclear and vague items, and these responses were excluded in subsequent analyses.

Item Generation and Refinement

Assembly of Initial Item Pool

A deductive approach (Hinkin, 1998) was used to generate items based on the initial theoretical definition of each construct and its dimensions. Three researchers were involved in the process of item generation to ensure content validity and that the items thoroughly cover each construct domain. In the first item generation step, they developed 80 items for mechanisms of engagement in arts (and parallel 80 items for humanities), tapping into dimensions of immersion (19 items)—the passage of time (6 items), effortless involvement (7 items), and loss of self-consciousness (6 items); reflection (22 items)—internal-focused (thoughts, feelings, and behaviors of self; 8 items), internal focus (internal focused thoughts about life or worldview; 7 items), and external-focused (thoughts, feelings, and behaviors of others; 7 items); socialization (32 items) —relationships and conversations (10 items), identity (6 items), and identification (7 items); acquisition (9 items); and expression (7 items). Group 1 aimed to reduce this large pool of items to psychometrically sound items that would eventually comprise the scales and provide an initial test of the factorial structure of these scales. The reduced items from this step and their factor loading results are in the online supplemental materials.

Item Generation [II] and Refinement

In the second step of item generation and refinement, we added more scale items to all of the finalized factors from step 1 of the

item generation process using Group 1 (see online supplemental materials for the final results), particularly focusing on factors that did not produce the theorized structure. For instance, we expanded the reflection factors to include internally focused cognitive and emotional reflection. For the mechanism of socialization, we added some items to the identification factor with items that tapped into belonging, mattering, and respect. A significant change, however, was made to the acquisition measure. Specifically, we expanded upon its definition to include socio-cognitive processes of mastery, vicarious experiences, direct encouragement, and positive physiological responses. Accordingly, several items were developed for each subdimension using a similar procedure as step 1 of item generation. As a result, we developed 171 items for mechanisms of engagement in arts (and parallel 171 items for humanities), tapping into dimensions of immersion (19 items)—the passage of time, effortless involvement, and loss of self-consciousness; reflection (36 items)—internal-focused (thoughts, feelings, and behaviors of self), internal focus (internal focused thoughts about life or worldview), and external-focused (thoughts, feelings, and behaviors of others); socialization (34 items)—relationships and conversations, identity, and identification; acquisition (71 items)—mastery, vicarious experiences, direct encouragement, and positive physiological responses; and expression (11 items).

We used Group 2a for this step. The Appendix provides the final list of items for each dimension and we include the exploratory factor analysis findings in the Results section.

Item Testing and Selection

For both item generation round 1 and 2, the number of items was reduced through a two-step process. First, we excluded any item that 2% or more of the participants indicated as unclear. We then factor-analyzed the remaining items, using principal axis factor analysis with oblique (Promax) rotation. We used oblique rotation because factors within each mechanism were intercorrelated (see Table 1 in

Table 3

Final EFA Results for Experience of Immersion When Engaged in Activities Related to the Arts and Humanities—Group 2a

Items	Arts		Humanities	
When I engage in activities related to the [humanities/arts]...	Factor 1 Effort	Factor 2 Time	Factor 1 Effort	Factor 2 Time
1. I don't feel the passage of time	0.05	**0.84**	0.00	**0.83**
2. I feel that time stops	0.02	**0.65**	−0.07	**0.79**
3. I don't feel how the time passes	−0.06	**0.93**	0.06	**0.78**
4. I can easily devote my whole attention to the activity	**0.78**	−0.07	**0.77**	−0.05
5. Once started, continuing the activity takes no effort	**0.75**	−0.07	**0.91**	−0.17
6. I am no longer worried about the challenges of everyday life	**0.63**	0.13	**0.62**	0.18
7. I am easily taken away from the problems of daily life	**0.66**	0.18	**0.57**	0.24
8. What going on around me does not trouble me	**0.76**	−0.01	**0.66**	0.09
Variance explained by each factor	0.32	0.26	0.33	0.26
Eigen value	4.28	1.22	4.30	1.24
KMO	0.83		0.83	

Note. The EFA for arts and humanities were performed separately. The values in bold are factor loadings.

the online supplemental materials for full correlation between factors within each mechanism scale) and using an orthogonal rotation with correlated factors tends to overestimate loadings (Loehlin, 2004; Reise et al., 2000). Factors were initially identified using combination of Kaiser 1 rule (Kaiser, 1960) (including eigenvalues of greater than 1.0) and scree test with parallel analysis results (Horn, 1965): Parallel Analysis (PA) is considered the best empirical method for determining the number of factors in FA and PCA (Dinno, 2009; Henson & Roberts, 2006) and a combination approach of PA and another method is often recommended (Worthington & Whittaker, 2006).

Upon initial inspection of the results for the constructs that included negatively worded items (i.e., reverse-coded items), these items generally loaded on the same factor, while positively worded items generally loaded on their intended factors. Accordingly, these items were removed from the analysis. We removed items if the factor loading was low (smaller than 0.5) or the item was cross-loading on multiple factors (greater than 0.35), and if they were the lowest

loading items within each. Past research on the cutoffs for factor loading is flexible and generally 0.35–0.4 is considered a minimal threshold for factor loadings (Worthington & Whittaker, 2006). However, our goal was to only retain the highest loading items and, therefore, we used a more stringent cutoff. Items that conceptually belonged to a factor but statistically loaded on another factor were also identified as problematic and excluded (Awang, 2012; Tay & Jebb, 2017). Finally, as we intended to develop parallel questions across scales related to AH as much as possible, we retained the same items if the item loadings were similar (± 0.05).

For the finalized scale before we proceed to confirmatory factor analysis (CFA), we report the eigenvalues, variance explained, and factor loadings in Tables 3–7. We also report the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy to evaluate whether the item correlation matrix actually contains factors or simply chance correlations between variables. We use the recommendation from Tabachnick et al. (2007) and regard values of 0.60 and higher as required for good factor analysis.

Table 4

Final EFA Results for Experience of Socialization When Engaged in Activities Related to the Arts and Humanities—Group 2a

Items	Arts			Humanities		
My engagement in the [arts/humanities] allows me to...	Factor 1 Identity	Factor 2 Relationship	Factor 3 Conversation	Factor 1 Relationship	Factor 2 Identity	Factor 3 Conversation
1. Strengthen my current relationships	−0.04	**0.89**	0.05	**0.76**	0.13	0.04
2. Build deep relationships	0.10	**0.66**	0.18	**0.82**	−0.01	0.10
3. Maintain close relationships with others	0.10	**0.76**	0.08	**0.87**	0.02	0.02
4. Develop warm and trusting relationships	0.10	**0.65**	0.18	**0.70**	0.09	0.13
5. Feel closer to the people in my life	−0.01	**0.93**	−0.03	**0.78**	0.17	−0.05
6. Engage in more meaningful conversations	−0.05	0.07	**0.86**	−0.04	0.05	**0.88**
7. Have more interesting discussions with other people	0.07	−0.03	**0.85**	0.04	0.03	**0.83**
8. Get into deeper conversations with others	0.00	0.04	**0.86**	0.04	−0.02	**0.83**
9. Start inspiring discussions with other people	0.01	0.07	**0.77**	0.14	0.02	**0.68**
10. Develop a sense of identity	**0.87**	−0.03	−0.02	0.14	**0.71**	−0.02
11. Broaden the identities that are important to me.	**0.69**	0.10	0.08	0.00	**0.67**	0.19
12. Better understand who I am	**0.92**	−0.07	−0.01	0.04	**0.76**	0.05
13. Have a more accurate reflection of myself	**0.75**	0.03	0.08	−0.01	**0.83**	0.07
14. Be satisfied with my identities	**0.74**	0.13	−0.05	0.18	**0.76**	−0.09
Variance explained	0.23	0.22	0.21	0.23	0.21	0.19
Eigenvalues	9.11	1.38	0.72	9.31	1.09	0.75
KMO	0.95			0.96		

Note. The EFA for arts and humanities were performed separately. The values in bold are factor loadings.

Table 5
Final EFA Results for Reflectiveness When Engaged in Activities Related to the Arts and Humanities—Group 2a Sample

Items	Arts			Humanities		
	F1	F2	F3	F1	F2	F3
When I engage in activities related to the [arts/humanities]...	External	Emotional	Life	External	Emotional	Life
1. I reflect on the philosophy of life	0.03	0.02	**0.87**	−0.01	0.02	**0.86**
2. I think about the meaning of life	0.02	0.26	**0.62**	0.09	0.16	**0.61**
3. I look at my life in philosophical ways	0.03	0.13	**0.77**	−0.02	0.10	**0.82**
4. I engage in philosophical or abstract thinking	0.02	−0.11	**0.88**	0.15	−0.13	**0.81**
5. I am deeply contemplative	0.20	0.02	**0.62**	0.19	0.06	**0.65**
6. I savor past experiences	−0.05	**0.95**	−0.04	0.01	**0.88**	−0.02
7. I take time to enjoy past positive feelings	0.03	**0.76**	0.04	0.00	**0.85**	0.01
8. I cherish the events of my life	0.11	**0.72**	0.04	0.08	**0.77**	−0.01
9. I relive my past experiences	0.09	**0.77**	−0.04	−0.05	**0.65**	0.21
10. I relish past positive feelings	−0.08	**0.87**	0.05	.00	**0.89**	−0.05
11. I try to understand events from others' perspectives	**0.86**	0.05	0.02	**0.79**	0.03	0.05
12. I try to take other people's perspectives	**0.89**	−0.05	0.02	**0.85**	0.04	−0.02
13. I imagine how other people are thinking	**0.77**	0.17	−0.04	**0.84**	−0.03	0.01
14. I seek to understand other people's viewpoint	**0.81**	0.01	0.05	**0.72**	0.03	0.15
15. I make an effort to see the world through others' eyes	**0.84**	−0.06	0.09	**0.88**	0.00	0.02
Variance explained	0.24	0.23	0.19	0.23	0.23	0.20
Eigenvalues	9.38	1.43	0.94	9.12	1.60	0.86
KMO	0.96			0.95		

Note. The EFA for arts and humanities were performed separately. The values in bold are factor loadings.

Cross-Validation Validation of the Scales

Factor Structure

We inspected each measure using multidimensional CFA to ensure that specified factors within each measure were a good fit to the data and used the *lavaan* package on R for this analysis (R Core Team, 2019; Rosseel, 2012). We reported fit indices such as χ^2 values with degrees of freedom, comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA) (with 95% CI), and standardized root mean square residual SRMR. The minimum standards used for a good fit were CFI ≥ 0.90, TLI ≥ 0.90, RMSEA ≤ 0.08, SRMR ≤ 0.08 (Awang, 2012; Tay & Jebb, 2017). If each measure met two or more of these recommended standards, we regarded the scales to have a good fit. If they did not, we investigated the path coefficients and modification indices and removed items that hindered the fit.

Test–Retest Reliability and Validity

The finalized scale was validated in a follow-up study 2 months later (Group 2a and Group 2b). The test–retest reliabilities of the mechanism scales were also reported. To determine convergent validity in predicting well-being outcomes, a correlation table showing the relationship between the mechanism factors and flourishing outcome is presented in Table 8. We also presented concurrent and predictive validity of the new scales and their dimensions for flourishing and well-being outcomes (r1 and r2, respectively). Furthermore, we used relative weight analysis (RWA) (Johnson, 2000; Tonidandel & LeBreton, 2015) to examine the relative importance of the five mechanisms for well-being outcomes using the rwa package on R (Chan, 2020). RWA decomposes the total variance in a regression model (R2) into weights that represent the proportional contribution of the multiple predictor variables and shows what variable is ranked highest based on their contribution to the total variance (R2). It is a particularly useful technique when predictors are correlated to each other as it addresses the multicollinearity problem.

Measurement Equivalence

Using the *semTools* package on R (Jorgensen et al., 2020), we conducted measurement equivalence tests to ensure that the measure was equivalent between males and females, between arts and humanities, and over time. This would provide evidence that the dimensional structure of the mechanisms holds between genders and between the arts and the humanities and longitudinally.

Results

Exploratory Factor Analyses Results

We report the findings of Exploratory Factor Analyses (EFA) of the final scale (using Group 2a sample) in Tables 3–7 along with the variance explained and eigenvalues. The final items were parallel for both

Table 6
Final EFA Results for Experience of Expression When Engaged in Activities Related to the Arts and Humanities—Group 2a

Items	Arts	Humanities
When I engage in activities related to the [arts/humanities]...	Factor 1	Factor 1
	Expression	Expression
1. I can freely express my thoughts and emotions	**0.93**	**0.92**
2. I can easily reveal my true self	**0.91**	**0.90**
3. I can easily communicate what I believe in	**0.90**	**0.91**
4. I feel I am being authentic	**0.83**	**0.88**
5. I can authentically disclose my values and beliefs	**0.82**	**0.89**
Variance explained	0.68	0.70
Eigenvalues	4.06	4.21
KMO	0.91	0.92

Note. The EFA for arts and humanities were performed separately. The values in bold are factor loadings.

Table 7

Final EFA Results for Acquisition When Engaged in Activities Related to the Arts and Humanities—Group 2a

Items	Arts						Humanities					
When I engage in activities related to the [arts/ humanities]...	F1 DE	F2 VE	F3 EM-A	F4 EM-S	F5 SP	F6 PP	F1 DE	F2 EM-A	F3 VE	F4 EM-S	F5 SP	F6 PP
1. I develop new skills and abilities	−0.01	−0.01	**0.96**	−0.08	0.01	0.06	0.04	**0.95**	−0.04	−0.05	−0.03	−0.02
2. I improve upon my skills and abilities	0.00	0.00	**0.90**	0.02	0.02	−0.02	0.02	**0.85**	−0.07	0.09	−0.03	−0.01
3. I learn new abilities	−0.02	0.01	**0.93**	−0.02	0.02	−0.01	0.04	**0.88**	0.06	−0.10	−0.03	0.02
4. I build new competencies and capabilities	0.01	0.02	**0.79**	0.10	−0.05	0.04	−0.11	**0.77**	0.04	0.10	0.08	0.03
5. I acquire experiences to master new techniques	0.06	0.02	**0.78**	0.09	0.00	−0.05	0.05	**0.65**	0.05	0.05	0.05	0.03
6. I feel competent	0.00	−0.01	0.01	**0.84**	−0.01	0.00	0.06	0.00	0.05	**0.67**	−0.10	0.17
7. I feel that I do well in general	−0.02	0.03	−0.02	**0.91**	0.00	0.01	−0.02	−0.03	−0.01	**0.80**	0.00	0.12
8. I feel a sense of accomplishment	0.04	−0.04	0.16	**0.73**	0.04	0.01	−0.07	0.12	0.08	**0.86**	−0.01	−0.07
9. I feel successful	0.02	0.04	−0.03	**0.89**	−0.02	0.01	0.07	−0.01	0.03	**0.88**	−0.01	−0.03
10. I feel a positive sense of personal success	0.00	0.00	0.10	**0.79**	0.05	−0.02	0.01	0.01	−0.08	**0.95**	0.09	−0.07
11. I learn how to behave successfully by watching successful others	−0.05	**0.91**	−0.03	0.05	−0.02	−0.01	−0.03	0.03	**0.80**	0.00	0.01	−0.01
12. I develop confidence in my abilities by learning from the mistakes of others	0.06	**0.76**	−0.02	0.08	0.04	−0.01	0.07	0.02	**0.76**	0.03	−0.02	0.07
13. Observing others pushes me to do better	0.08	**0.65**	0.09	−0.04	0.09	0.04	−0.08	0.00	**0.82**	−0.05	0.14	0.03
14. I can picture myself to behave similarly to those around me	−0.03	**0.84**	−0.05	−0.04	0.08	0.09	0.00	−0.08	**0.82**	0.07	−0.02	0.02
15. I discover new ways of behaving by observing others	−0.01	**0.94**	0.06	−0.02	−0.12	−0.07	0.04	0.04	**0.89**	0.02	−0.06	−0.08
16. Others praise my skills	**0.96**	0.06	0.02	0.01	−0.11	0.00	**0.88**	0.02	−0.02	−0.06	0.08	0.05
17. People tell me that I am skilled	**0.96**	−0.01	0.02	0.05	−0.06	−0.03	**0.92**	0.01	−0.01	0.01	0.01	0.00
18. Others tell me that I am talented	**0.95**	−0.03	0.00	−0.01	0.04	0.01	**0.97**	−0.03	−0.01	0.00	−0.02	−0.03
19. My competencies and capabilities are complimented	**0.82**	0.03	0.03	−0.03	0.12	−0.01	**0.81**	0.05	0.03	0.04	0.00	0.00
20. I am praised for my abilities	**0.92**	−0.03	−0.05	−0.01	0.08	0.02	**0.91**	−0.01	0.01	0.04	0.00	−0.03
21. I am persuaded to face my challenges	0.03	0.28	0.04	−0.03	**0.55**	0.01	0.05	0.05	0.12	0.01	**0.65**	0.01
22. I receive valuable feedback from others that helps me improve	0.05	0.04	0.10	−0.04	**0.78**	−0.02	0.18	−0.02	0.02	0.02	**0.74**	−0.04
23. I am pushed to do better	−0.02	0.13	−0.02	0.05	**0.79**	−0.05	−0.01	0.00	0.14	0.03	**0.81**	−0.10
24. I feel supported when needed	0.03	−0.02	0.01	0.07	**0.81**	0.00	−0.05	−0.02	−0.10	0.02	**0.97**	0.07
25. I find people who advocate for me	0.11	0.01	−0.06	−0.01	**0.81**	0.02	0.13	0.00	−0.01	−0.08	**0.84**	0.03
26. I feel relaxed and calm	−0.05	0.05	0.03	0.04	−0.04	**0.66**	−0.05	0.04	−0.02	−0.02	−0.04	**0.85**
27. I feel free	0.04	0.01	−0.02	0.32	0.01	**0.52**	0.03	−0.05	0.07	0.09	0.11	**0.69**
28. I feel at ease	0.02	−0.03	0.00	−0.09	0.01	**1.05**	0.02	0.01	−0.03	−0.01	−0.02	**0.94**
Eigenvalues	15.66	1.48	2.19	2.00	0.97	0.81	14.35	1.06	1.87	2.56	1.95	0.89
Variance Explained	0.16	0.14	0.15	0.14	0.12	0.07	0.16	0.13	0.13	0.14	0.13	0.08
KMO	0.96						0.95					

Note. The EFA for arts and humanities were performed separately. The values in bold are factor loadings. VE = Vicarious Experience; DE = Direct Encouragement; SP = Social Persuasion; EM-A = Experience of Mastery—Ability; EM-S = Experience of Mastery—Success; PP = Positive Physiological Response.

arts and humanities. *Immersion* emerged as a two-dimension construct instead of originally proposed three-dimension construct. Factor 1 was items related to the passage of time, whereas factor 2 (called effort) included items related to the effortless involvement dimension as well as the loss of self-consciousness. Meanwhile, as theorized, *expression* emerged as a one-factor construct. For *reflection*, however, the items on emotional self-reflection formed a single factor while the items on cognitive self-reflection loaded sporadically across factors, and therefore, these items were excluded. The other two factors (internal reflection about life and external reflection) emerged as theorized. For *socialization*, the identification dimension of socialization did not form a separate factor and was excluded while relationships and conversation emerged as separate factors.

The EFA results for *acquisition* suggested that it represented a six-factor solution instead of the proposed four-factor construct. Specifically, the proposed mastery experience dimension represented two factors of ability and success. Similarly, the proposed direct encouragement dimension represented two factors

representing direct encouragement and social persuasion. One factor loading exceeded 1. However, since we used oblique rotation, the loadings operate more like regression coefficients and can be slightly larger than 1.0 in magnitude (Jöreskog, 1999). Based on reviewer suggestions, we also conducted a five-factor EFA with all of the items and components to investigate whether there may be cross-loading across factors. We did not find any cross-loading and have included the full EFA table in the Appendix.

CFA Results

We ran CFA looking at the theorized factor structure of all mechanisms using Group 3 sample: *immersion* as a two-factor construct (effort and passage of time), *expression* as one-factor, *socialization* a three-factor (relationships, identity, conversation), *reflection* a three-factor (life/worldview, emotional, and external), *acquisition* a six-factor construct (vicarious experience, direct encouragement, social persuasion, experience of mastery—ability, experience of mastery—success, and positive physiological response).

Table 8

Concurrent (r1) and Predictive (r2) Validity of Mechanisms of Arts and Humanities—Group 2a and 2b

Variables	CIT		Meaning in life		Civic engagement		Curiosity exploration		Work-life balance		Job satisfaction		Positive affect		Negative affect		Interpersonal reactivity index	
	r_1	r_2	r_1	r_2	r_1	r_2	r_1	r_2	r_1	r_2	r_1	r_2	r_1	r_2	r_1	r_2	r_1	r_2
Arts																		
Immersion	0.20**	0.28**	0.07	0.16***	0.22**	0.23**	0.23**	0.23**	0.10	0.22**	0.12	0.13*	0.19**	0.27**	−0.010	−0.09	0.26**	0.27**
Time	0.06	0.14*	0	0.11	0.15*	0.12	0.09	0.13*	0.01	0.14*	0.04	0.06	0.05	0.15*	−0.01	−0.01	0.19**	0.16**
Effort	0.33**	0.38**	0.13*	0.17**	0.24**	0.31**	0.35**	0.29**	0.20**	0.25**	0.19**	0.18**	0.32**	0.35**	−0.18**	−0.16**	0.29**	0.32**
Reflection	0.38**	0.63**	0.44**	0.52**	0.37**	0.45**	0.48**	0.48**	0.45**	0.41**	0.17**	0.47**	0.42**	0.44**	0.00	0.03	0.37**	0.34**
Life	0.32**	0.40**	0.36**	0.40**	0.37**	0.45**	0.42**	0.43**	0.17**	0.22**	0.14*	0.26**	0.35**	0.39**	0.00	0.00	0.30**	0.36**
Emotional	0.38**	0.42**	0.34**	0.33**	0.43**	0.40**	0.40**	0.39**	0.18**	0.27**	0.25**	0.34**	0.42**	0.44**	0.01	−0.01	0.28**	0.29**
External	0.29**	0.38**	0.41**	0.38**	0.43**	0.46**	0.33**	0.33**	0.07	0.19**	0.15*	0.30**	0.29**	0.36**	0.07	0.00	0.36**	0.40**
Expression	0.39**	0.62**	0.33**	0.36**	0.30**	0.39**	0.37**	0.61**	0.52**	0.24	0.20**	0.38**	0.38**	0.46**	−0.19**	−0.08	0.30**	0.52**
Acquisition	0.52**	0.52**	0.42**	0.37**	0.46**	0.46**	0.49**	0.45**	0.33**	0.40**	0.38**	0.44**	0.48**	0.52**	−0.13**	−0.13*	0.38**	0.33**
EMA	0.35**	0.32**	0.37**	0.31**	0.39**	0.30**	0.36**	0.33**	0.17**	0.32**	0.25**	0.23**	0.32**	0.34**	−0.01	−0.11	0.33**	0.22**
EMS	0.55**	0.54**	0.38**	0.34**	0.40**	0.44**	0.49**	0.44**	0.36**	0.42**	0.35**	0.38**	0.45**	0.50**	−0.20**	−0.19**	0.33**	0.30**
VE	0.35**	0.40**	0.40**	0.35**	0.35**	0.38**	0.40**	0.36**	0.16**	0.24**	0.27**	0.39**	0.39**	0.42**	−0.01	−0.04	0.27**	0.22**
DE	0.36**	0.35**	0.27**	0.25**	0.37**	0.34**	0.37**	0.35**	0.26**	0.29**	0.32**	0.36**	0.36**	0.39**	−0.13**	−0.14**	0.24**	0.22**
SP	0.48**	0.45**	0.43**	0.34**	0.46**	0.43**	0.48**	0.38**	0.36**	0.38**	0.39**	0.46**	0.47**	0.48**	−0.15**	−0.11	0.36**	0.25**
PP	0.48**	0.48**	0.31**	0.36**	0.31**	0.32**	0.40**	0.34**	0.35**	0.37**	0.27**	0.27**	0.39**	0.40**	−0.24**	−0.23**	0.25**	0.27**
Socialization	0.47**	0.67**	0.46**	0.53**	0.36**	0.58**	0.49**	0.50**	0.46**	0.47**	0.28**	0.62**	0.48**	0.53**	−0.11	−0.04	0.36**	0.48**
Relationships	0.43**	0.50**	0.40**	0.38**	0.47**	0.48**	0.37**	0.33**	0.30**	0.33**	0.38**	0.44**	0.44**	0.50**	−0.02	−0.14*	0.33**	0.29**
Conversation	0.39**	0.48**	0.46**	0.38**	0.37**	0.47**	0.43**	0.39**	0.14*	0.24**	0.25**	0.35**	0.44**	0.50**	0.00	−0.1	0.29**	0.28**
Identity	0.42**	0.45**	0.37**	0.39**	0.44**	0.47**	0.49**	0.36**	0.26**	0.32**	0.26**	0.34**	0.40**	0.46**	−0.10	−0.04	0.37**	0.32**
Humanities																		
Immersion	0.26**	0.24**	.22**	.22*	0.33**	0.25**	0.25**	0.27**	0.12	0.15*	0.17*	0.13*	0.24**	0.20**	−0.04	−0.02	0.37**	0.30**
Time	0.13*	0.11	0.16**	0.14*	0.23**	0.16*	0.13*	0.16**	.05	.06	0.11	.07	0.15*	0.10	0.03	0.04	0.27**	0.22**
Effort	0.36**	0.33**	0.24**	0.25**	0.39**	0.29**	0.34**	0.32**	0.17**	0.23**	0.21**	0.18**	0.31**	0.26**	−0.11	−0.09	0.37**	0.32**
Reflection	0.43**	0.50**	0.42**	0.43**	0.45**	0.59**	0.58**	0.46**	0.43**	0.46**	0.20**	0.53**	0.41**	0.32**	0.01	−0.01	0.45**	0.44**
Life	0.33**	0.31**	0.31**	0.37**	0.48**	0.42**	0.34**	0.40**	0.15*	0.19**	0.19**	0.17**	0.31**	0.27**	0	−0.01	0.37**	0.35**
Emotional	0.46**	0.40**	0.45**	0.39**	0.55**	0.43**	0.40**	0.35**	0.22**	0.27**	0.32**	0.31**	0.45**	0.36**	−0.05	−0.03	0.35**	0.30**
External	0.30**	0.24**	0.32**	0.30**	0.43**	0.43**	0.35**	0.32**	0.12	0.11	0.18**	0.12	0.26**	0.20**	0.05	0.08	0.43**	0.45**
Expression	0.43**	0.48**	0.36**	0.25*	0.36**	0.49**	0.51**	0.44**	0.47**	0.19	0.19**	0.45**	0.39**	0.27**	−0.06	−0.10	0.36**	0.51**
Acquisition	0.49**	0.47**	0.45**	0.47**	0.57**	0.53**	0.43**	0.45**	0.25**	0.26**	0.37**	0.36**	0.51**	0.46**	−0.02	−0.02	0.42**	0.48**
EMA	0.33**	0.25**	0.33**	0.33**	0.45**	0.38**	0.36**	0.32**	0.19**	0.08	0.24**	0.15*	0.35**	0.27**	−0.02	0.09	0.36**	0.30**
EMS	0.48**	0.44**	0.34**	0.37**	0.44**	0.39**	0.35**	0.38**	0.28**	0.24**	0.31**	0.30**	0.45**	0.35**	−0.06	−0.10	0.36**	0.35**
VE	0.31**	0.34**	0.44**	0.39**	0.51**	0.50**	0.36**	0.40**	.09	.09	0.23**	0.20**	0.40**	0.34**	0.07	0.08	0.33**	0.39**
DE	0.34**	0.33**	0.30**	0.38**	0.42**	0.41**	0.28**	0.31**	0.17**	0.23**	0.30**	0.31**	0.36**	0.38**	0.03	−0.01	0.18**	0.23**
SP	0.50**	0.43**	0.46**	0.45**	0.56**	0.51**	0.40**	0.38**	0.27**	0.31**	0.41**	0.42**	0.51**	0.49**	−0.06	−0.02	0.35**	0.32**
PP	0.47**	0.40**	0.38**	0.36**	0.42**	0.28**	0.38**	0.41**	0.34**	0.35**	0.32**	0.30**	0.46**	0.33**	−0.20**	−0.21**	0.33**	0.23**
Socialization	0.43**	0.50**	0.46**	0.46**	0.37**	0.68**	0.58**	0.37**	0.35**	0.36**	0.19**	0.62**	0.43**	0.42**	0.03	−0.00	0.37**	0.44**
Relationships	0.41**	0.45**	0.45**	0.43**	0.57**	0.54**	0.30**	0.32**	0.21**	0.32**	0.39**	0.39**	0.44**	0.44**	0.01	−0.02	0.37**	0.44**
Conversation	0.38**	0.33**	0.37**	0.32**	0.48**	0.46**	0.29**	0.30**	0.17**	0.15*	0.29**	0.22**	0.36**	0.35**	0.06	0.04	0.32**	0.34**
Identity	0.37**	0.37**	0.41**	0.44**	0.50**	0.50**	0.37**	0.38**	0.13*	0.21**	0.28**	0.29**	0.35**	0.36**	−0.07	0.06	0.37**	0.35**

Note. r1 is concurrent validity and r2 is predictive validity.

Table 9

Model Fits for All of the Mechanisms for Arts and Humanities-Group 3

Mechanisms	χ^2 (df)	CFI	TLI	RMSEA [95% CI]	SRMR
Arts					
Immersion (two-factor model)	6.5 (8)	1.00	1.00	0.000 [0.000, 0.066]	0.021
Reflection (three-factor model)	122.3 (87)	0.975	0.969	0.041 [0.022, 0.057]	0.050
Expression (one-factor model)	6.2 (5)	0.995	0.990	0.032 [0.000, 0.100]	0.025
Acquisition (six-factor model)	573.7 (309)	0.910	0.898	0.060 [0.052, 0.067]	0.051
Socialization (three-factor model)	126.9 (74)	0.967	0.960	0.055 [0.038, 0.071]	0.042
Humanities					
Immersion (two-factor model)	11.0 (8)	0.992	0.984	0.039 [0.000, 0.091]	0.033
Reflection (three-factor model)	182.3 (87)	0.918	0.900	0.068 [0.054, 0.081]	0.057
Expression (one-factor model)	8.2 (5)	0.991	0.983	0.052 [0.000, 0.113]	0.027
Acquisition (six-factor model)	566.6 (335)	0.929	0.920	0.054 [0.046, 0.061]	0.051
Socialization (three-factor model)	144.4 (74)	0.942	0.928	0.063 [0.051, 0.078]	0.049

Immersion and Acquisition did not fit our criteria of a good fit. Therefore, we revisited the original EFA, the CFA loadings, as well as the modification indices and identified items that had comparatively low loadings in EFA, path coefficient values, and correlated with other factors or items in other factors. We removed two items from Effort factor of Immersion and 1 item each from Experience of mastery—ability and Experience of mastery—success factors of Acquisition. While there are some concerns with using modification indices (MacCallum et al., 1992), we did not use this method in an a purely data-driven manner: rather, used it to identify items that were already loading lower than others and potentially cross-loading on to different factors if allowed to load free. The resulting CFA suggested that the factor structure of all mechanisms had a good fit to the data. For all of the models, at least three out of four criteria (CFI, TLI, SRMR, and 95% RMSEA confidence intervals [CI]) met the specified cutoffs for a good/acceptable fitting model. The fit indices are reported in Table 9.

Reliability

All of the measures demonstrated high internal consistency as measured by Cronbach's alpha, with all mechanisms ranging from .87 to .97 (Table 10) in both Group 2a and the follow-up Group 2b. The scales also had good test–retest reliabilities between Time 1 and Time 2 as shown in the diagonal of Table 10, ranging from 0.50 to 0.72. Since the nature of engagement in AH is not proposed to be stable traits and the measurements were considerably spaced apart (2 months), we considered >0.50 to be good metrics for test–retest reliability (Cicchetti, 1994; Fleiss, 1986).

Concurrent and Predictive Validity

Table 8 shows concurrent and predictive validity of mechanisms and their dimensions with outcome variables. As predicted, all of the mechanisms had a significant positive predictive and concurrent validity for flourishing outcomes, including the CIT, meaning in life scale, civic engagement, curiosity exploration, positive affect, and interpersonal reactivity index. One of the few deviations was that immersion in the arts did not predict meaning in life and work–life balance (though they did correlate longitudinally) and was not concurrently correlated to job satisfaction: this was because the passage of time dimension of immersion was not a significant predictor of these outcomes. Similarly, negative affect was

Table 10

Means and Standard Deviations with Correlations at Time 1 (Upper Diagonal) and Time 2 (Lower Diagonal)—Group 2a and 2b

Variable	Time 1 M (SD)	α	Time 2 M (SD)	α	1	2	3	4	5	6	7	8	9	10
Arts														
1. Immersion	3.69 (0.87)	0.82	3.71 (0.90)	0.86	(0.52)	0.32*	0.65**	0.48**	0.51**	0.48**	0.23	0.39**	0.35**	0.34**
2. Reflection	3.88 (0.90)	0.96	3.77 (0.94)	0.96	0.34**	(0.64)	0.64**	0.76**	0.75**	0.37**	0.69**	0.45**	0.56**	0.58**
3. Expression	4.30 (0.72)	0.93	4.26 (0.86)	0.93	0.47**	0.59**	(0.62)	0.66**	0.70**	0.36**	0.41**	0.65**	0.47**	0.40**
4. Acquisition	3.91 (0.85)	0.97	3.93 (0.84)	0.97	0.42**	0.57**	0.69**	(0.71)	0.81**	0.38**	0.75**	0.54**	0.71**	0.65**
5. Socialization	3.81 (0.98)	0.96	3.83 (0.94)	0.96	0.38**	0.74**	0.61**	0.70**	(0.73)	0.42**	0.59**	0.46**	0.69**	0.68**
Humanities														
6. Immersion	3.37 (0.96)	0.85	3.51 (0.98)	0.88	0.58**	0.33**	0.31**	0.35**	0.39**	(0.49)	0.40**	0.32*	0.61**	0.52**
7. Reflection	3.98 (0.80)	0.95	4.04 (0.82)	0.95	0.37**	0.63**	0.45**	0.47**	0.54**	0.52**	(0.69)	0.48**	0.72**	0.69**
8. Expression	4.35 (0.66)	0.95	4.19 (0.90)	0.94	0.33**	0.44**	0.51**	0.42**	0.47**	0.52**	0.67**	(0.50)	0.58**	0.64**
9. Acquisition	3.81 (0.82)	0.96	3.88 (0.83)	0.97	0.26**	0.57**	0.45**	0.59**	0.63**	0.50**	0.73**	0.71**	(0.69)	0.84**
10. Socialization	3.87 (0.92)	0.96	3.93 (0.94)	0.96	0.29**	0.56**	0.47**	0.54**	0.71**	0.51**	0.72**	0.68**	0.78**	(0.69)

Note. The diagonal values represent test–retest reliabilities of the subscales from T1 and T2.
*p < .05.   **p < .01.

Table 11

Results from Relative Weight Analysis of the Mechanisms of Engagement Scales for Flourishing Outcomes—Group 2b

Mechanisms	CIT	Meaning in life	Civic engagement	Curiosity exploration	Work–life balance	Job satisfaction	Positive affect	Negative affect	Interpersonal reactivity index
Arts									
Immersion	2.98	2.25	4.30	4.20	2.43	2.37	3.06	16.15	13.43
Reflection	15.94	30.39	31.00	19.93	7.62	8.51	19.82	20.51	26.23
Expression	14.76	10.49	10.88	32.84	10.55	8.88	14.44	11.44	11.87
Acquisition	37.70	28.52	26.32	24.82	48.58	45.54	32.22	42.89	23.09
Socialization	28.62	28.36	27.51	18.21	30.80	34.69	30.45	9.00	25.37
Total R^2	0.30	0.26	0.29	0.32	0.12	0.17	0.27	0.04	0.20
Humanities									
Immersion	5.17	4.14	6.16	5.84	4.76	4.02	4.81	5.63	17.74
Reflection	21.50	23.21	27.20	24.23	18.05	12.01	17.60	8.81	34.09
Expression	21.01	11.66	16.83	35.67	17.34	18.19	16.36	66.06	15.42
Acquisition	31.07	29.64	23.58	22.63	43.57	32.49	39.87	9.22	16.81
Socialization	21.25	31.36	26.22	11.63	16.26	33.29	21.36	10.28	15.93
Total R^2	0.27	0.25	0.40	0.25	0.06	0.15	0.26	0.02	0.27

largely uncorrelated with any of the mechanisms in the humanities and most of the mechanisms in the arts, except for art expression (concurrently*)* and art acquisition (concurrently and predictive) in negative direction. The correlation results with the dimensions within each arts mechanism show that only the effort dimension of immersion, experience of mastery—success, direct encouragement, and positive physiological response dimensions of acquisition had significant concurrent and predictive validity for negative affect.

To examine the relative importance among the mechanisms for predicting well-being outcomes, we used RWA to determine which mechanism was a more important predictor for each outcome (Table 11). Specifically, RWA shows the proportion of variance in R2 that is explained by each variable which helps us rank which predictor is the most important. We found that acquisition in arts and humanities was the most important predictor for CIT, work–life balance, and positive affect while only acquisition in arts was the most important predictor for negative affect and job satisfaction. Similarly, socialization in humanities was the most important mechanism for meaning in life and job satisfaction, followed closely by acquisition and reflection. In addition, reflection in arts and humanities was the most important mechanism for predicting civic engagement and interpersonal reactivity index. Finally, expression in arts and humanities was the most important mechanism for curiosity exploration while expression in humanities was the strongest predictor of negative affect.

Measurement Equivalence

We tested measurement equivalence for arts versus humanities (Table 12), men versus women (Table 13), and across time (Table 14). Generally, a chi-square difference test for measurement equivalent is too sensitive to sample size, and therefore, a relative fit was examined via a change in CFI (ΔCFI). A model fit is practically equivalent to another if the CFI changes less than 0.01 (Cheung & Rensvold, 2002). The goodness-of-fit indices suggested a good model fit across both gender for tests of configural, metric, and scalar invariance; the ΔCFI was lower than 0.01 comparing configural versus metric and metric versus scalar models. Similarly,

the goodness-of-fit indices suggest that there is measurement equivalence between arts and humanities as well as between Time 1 and Time 2 across tests of configural, metric, and scalar invariance. The equivalence test results and reliabilities between Time 1 and Time 2 suggest that the structures of the scales are stable across repeated measurements.

Discussion

While there has been a sizable theoretical and empirical interest in the benefits of engagement in AH, there is still much to learn about the underlying mechanisms through which engagement in AH leads to well-being outcomes. A major reason for this overlook is the lack of well-validated scales that measure such

Table 12

Measurement Equivalence Between Arts and Humanities Engagement Mechanism Scales

Model	χ^2 (df)	CFI	ΔCFI	TLI	RMSEA	SRMR
Immersion						
Configural	52.6 (16)	0.980		0.962	0.096	0.053
Metric	54.4 (20)	0.981	0.001	0.971	0.083	0.056
Scalar	59.5 (24)	0.980	0.001	0.975	0.077	0.056
Reflection						
Configural	580.6 (174)	0.956		0.947	0.097	0.045
Metric	588.7 (186)	0.957	0.000	0.951	0.094	0.046
Scalar	596.3 (198)	0.957	0.000	0.954	0.090	0.046
Expression						
Configural	27.5 (10)	0.992		0.983	0.084	0.012
Metric	30.8 (14)	0.992	0.000	0.988	0.069	0.024
Scalar	35.9 (18)	0.991	0.000	0.990	0.061	0.026
Acquisition						
Configural	1,392.5 (568)	0.942		0.933	0.079	0.043
Metric	1,664.1 (588)	0.942	0.000	0.936	0.077	0.045
Scalar	1,697.1 (608)	0.941	0.001	0.937	0.077	0.046
Socialization						
Configural	297.9 (148)	0.980		0.975	0.064	0.030
Metric	317.1 (159)	0.979	0.001	0.976	0.064	0.042
Scalar	339.4 (170)	0.977	0.002	0.976	0.064	0.044

Note. df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Table 13

Measurement Equivalence Between Males and Females for Both Arts and Humanities Engagement Mechanism Scales

Model	$\chi^2(df)$	CFI	ΔCFI	TLI	RMSEA	SRMR
		Arts				
Immersion						
Configural	31.1 (16)	0.983		0.967	0.086	0.048
Metric	38.6 (20)	0.978	0.004	0.968	0.086	0.062
Scalar	40.8 (24)	0.981	0.002	0.976	0.074	0.064
Reflection						
Configural	425.4 (174)	0.95		0.94	0.108	0.047
Metric	437.9 (186)	0.95	0.000	0.943	0.104	0.052
Scalar	445.9 (198)	0.951	0.001	0.948	0.1	0.053
Expression						
Configural	28.0 (10)	0.982		0.964	0.12	0.018
Metric	36.7 (14)	0.978	0.004	0.968	0.112	0.047
Scalar	43.9 (18)	0.974	0.004	0.971	0.107	0.051
Acquisition						
Configural	1,162.5 (568)	0.922		0.910	0.094	0.053
Metric	1,189.2 (588)	0.921	0.001	0.913	0.093	0.061
Scalar	1,207.7 (608)	0.921	0.000	0.916	0.092	0.061
Socialization						
Configural	246.2 (148)	0.973		0.967	0.074	0.032
Metric	259.3 (159)	0.972	0.001	0.968	0.072	0.043
Scalar	271.5 (170)	0.972	0	0.97	0.07	0.044
		Humanities				
Immersion						
Configural	40.7 (16)	0.973		0.950	0.111	0.060
Metric	42.4 (20)	0.976	0.003	0.964	0.095	0.061
Scalar	43.0 (24)	0.979	0.004	0.974	0.080	0.061
Reflection						
Configural	391.7 (174)	0.950		0.94	0.101	0.048
Metric	407.4 (186)	0.949	0.001	0.943	0.099	0.054
Scalar	420.5 (198)	0.949	0.000	0.946	0.096	0.055
Expression						
Configural	30.4 (10)	0.982		0.964	0.128	0.02
Metric	38.0 (14)	0.979	0.003	0.969	0.117	0.048
Scalar	39.7 (18)	0.981	0.002	0.978	0.098	0.048
Acquisition						
Configural	1,153.6 (568)	0.917		0.905	0.094	0.053
Metric	1,165.3 (588)	0.919	0.001	0.910	0.092	0.055
Scalar	1,180.5 (608)	0.919	0.000	0.914	0.090	0.055
Socialization						
Configural	335.8 (148)	0.953		0.942	0.101	0.041
Metric	341.3 (159)	0.954	0.001	0.948	0.096	0.043
Scalar	351.6 (170)	0.955	0.000	0.951	0.093	0.044

Note. df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Table 14

Measurement Equivalence Between Time 1 and Time 2 for Both Arts and Humanities Engagement Mechanism Scales

Model	$\chi^2(df)$	CFI	ΔCFI	TLI	RMSEA	SRMR
		Arts				
Immersion						
Configural	49.6 (16)	0.977		0.957	0.091	0.045
Metric	56.5 (20)	0.975	0.002	0.963	0.085	0.052
Scalar	79.6 (24)	0.962	0.013	0.953	0.095	0.059
Reflection						
Configural	485.6 (174)	0.962		0.954	0.085	0.044
Metric	501.4 (186)	0.962	0.000	0.957	0.083	0.050
Scalar	515.9 (198)	0.961	0.000	0.959	0.081	0.051
Expression						
Configural	22.3 (10)	0.994		0.988	0.070	0.012
Metric	22.9 (14)	0.996	0.002	0.994	0.050	0.015
Scalar	28.2 (18)	0.995	0.001	0.995	0.047	0.019
Acquisition						
Configural	1,198.9 (568)	0.954		0.948	0.069	0.039
Metric	1,236.8 (588)	0.953	0.001	0.948	0.068	0.047
Scalar	1,269.4 (608)	0.952	0.001	0.949	0.068	0.048
Socialization						
Configural	262.4 (148)	0.984		0.980	0.056	0.024
Metric	268.6 (159)	0.985	0.001	0.982	0.053	0.029
Scalar	281.7 (170)	0.984	0.000	0.983	0.052	0.030
		Humanities				
Immersion						
Configural	78.8 (16)	0.962		0.929	0.125	0.063
Metric	84.5 (20)	0.961	0.001	0.941	0.113	0.069
Scalar	94.3 (24)	0.957	0.004	0.947	0.108	0.071
Reflection						
Configural	462.9 (174)	0.959		0.951	0.083	0.041
Metric	486.6 (186)	0.958	0.002	0.952	0.082	0.047
Scalar	494.3 (198)	0.958	0.001	0.956	0.079	0.048
Expression						
Configural	25.0 (10)	0.994		0.987	0.077	0.011
Metric	27.6 (14)	0.994	0.001	0.992	0.062	0.022
Scalar	30.3 (18)	0.995	0.001	0.994	0.052	0.023
Acquisition						
Configural	1,324.6 (568)	0.942		0.933	0.076	0.046
Metric	1,379.3 (588)	0.939	0.003	0.933	0.076	0.052
Scalar	1,412.3 (608)	0.938	0.001	0.934	0.076	0.053
Socialization						
Configural	334.7 (148)	0.974		0.968	0.072	0.032
Metric	353.0 (159)	0.973	0.001	0.969	0.071	0.041
Scalar	373.8 (170)	0.972	0.001	0.970	0.070	0.042

Note. df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

mechanisms. In this study, we developed and validated such scales to measure each of the five mechanisms of engagement in both the arts and humanities labeled RAISE (reflection, acquisition, immersion, socialization, expression). We validated the scales across U.S. samples with diverse demographics and presented evidence for the reliability and validity of the scales. Overall, the scales for both arts and humanities were internally consistent and had good test–retest reliability. We also tested measurement invariance across arts versus humanities, gender, and across time and found that the scale properties do not differ across these groups and over time. Therefore, we can reliably use this scale to make group-level comparisons across some demographic groups (gender), across different activities (arts vs humanities) as well as over time.

Changes in Factor Structure

There were some notable differences between our theorized scale structure and the finalized scale structure. We originally expected immersion to be a three-factor structure (effort, self-reflection, and passage of time), but self-reflection was subsumed under the effort factor of immersive experience. As such, the experience of effortless involvement included a lack of self-reflection and distance from everyday problems. Similarly, we originally proposed separate factors for the identity and identification dimensions of socialization and one factor for relationships and conversation. Instead, we found that the identity and identification dimensions were not differentiated, while there was a distinction between relationships (e.g., the experience of building a stronger bond with people through AH) and conversation (the

quality of conversation with others). Moreover, while reflection did emerge as a three-dimensional construct and contained life or worldview and external reflection items, the internal reflection items contained primarily emotional rather than cognitive content. The cognitive content originally included items such as reflection on thoughts and behaviors, values and beliefs, and judgments. However, it is likely that engagement in the arts and humanities does not feature reflection of that nature. Rather internal reflection may feature more emotional content, consisting of items concerning personal experience relishing and savoring experiences with arts and humanities. Furthermore, the final structure of acquisition reflected a six-factor structure instead of the initially proposed four-factor or one-factor structure. Specifically, the factor structure suggested that experience of mastery in terms of ability (experience of improving and building skills and abilities) was different from the experience of mastery in terms of success (feeling competent or successful). This differentiation parallels research on learning versus performance orientation in goal and motivation literature (Dweck & Leggett, 1988) and could represent different motivation and subsequent experiences in achieving expertise. Also, the proposed direct encouragement dimension represented two factors representing direct encouragement (received positive feedback) and social persuasion (received outside feedback that pushes them). These factors represent two submechanisms through which engagement in the arts and humanities may allow for opportunities to gain higher self-efficacy that subsequently act as a motivating push for continued participation in the AH.

RAISE Application in Future Research

The RAISE scale has a multitude of potential uses in future research. The scale allows researchers to quantify different moderating mechanisms through which people can engage in both the arts and the humanities. There is a mounting amount of research, along with systematic review studies and meta-analyses, investigating the effects of art domains, including music (Henderson et al., 2017), visual arts (Potash et al., 2013), drama (Feniger-Schaal & Orkibi, 2020), and dance (Koch et al., 2014), along with the effectiveness of interventions, such as art therapies (Maujean et al., 2014). However, some argue that the current evidence is skewed toward certain types of arts (e.g., music) (Fancourt & Finn, 2019) and not enough toward humanities. Creating both the arts and the humanities version of the RAISE mechanisms scale provides the field new tools to address this concern. Furthermore, the scale can be used in future studies to compare different types of artistic and humanities-related activities (art, dance, reading, etc.), various modes of engagement (teaching, creating, etc.), and how they may differentially affect varying forms of well-being through the RAISE mechanisms (Shim et al., 2021, 2019; Tay et al., 2018). For example, in the discipline of fine arts, visiting museums and observing art may promote reflectiveness, while creating art may activate expressiveness. Furthermore, the same artistic activity, done alone vs with others, may have differential flourishing effects (Shim et al., 2021). The RAISE scale can allow future investigations comparing these different activities at the level of their mechanisms that lead to flourishing outcomes.

Similarly, while past research suggests that artistic or humanities-centered activities contribute to proximal and long-term flourishing outcomes (Catterall et al., 2012; Sonke et al., 2015; Tymoszuk et al.,

2020; van Peer et al., 2007; Wheatley & Bickerton, 2017), the RAISE framework allows us to delineate what kinds of experiences during their engagement could be more associated with specific categories or types of well-being (e.g., general well-being vs. psychological competencies vs. normative outcomes: Tay et al., 2018).

Reflection

Reflection was one of the most important mechanisms for normative flourishing outcomes related to civic thoughts and activities as well as perspective-taking and empathy. This finding is supported by past research where reflection-focused artistic and humanities interventions have been utilized to encourage understanding of social issues such as racism (Godley et al., 2020) or mental illness stigma (Potash et al., 2013), and increase empathy in professional settings (Chen & Forbes, 2014). Similarly, along with socialization and acquisition, reflection was a strong predictor of the search for meaning in life. Artistic interventions focusing on these mechanisms have been used for introspective reframing of people's personal lives (Daher & Haz, 2011).

Acquisition

While engagement in the AH has broadly been tied to general well-being, we specifically found acquisition in arts and humanities to be one of the most predictive mechanisms for general well-being outcomes such as CIT, work–life balance, job satisfaction, and positive affect. Particularly, mastery and positive reinforcement during AH engagement were significantly associated with general and work-related well-being. This finding is informative since there have not been as many empirical works looking at how expertise in the arts and humanities affects well-being and, in fact, some focus on the detrimental side of the process of expertise, for example, the effects of over-practice in dance professionals such, as stress or pressure (Blevins et al., 2022). With this in mind, it is also helpful to note that the dimension of mastery here does not equate to peak mastery but the process of mastering abilities and skills with respect to arts and humanities. Future research can examine how the mastery process is related to well-being over time, and if there are negative effects in the short term.

Our work helps detangle the different aspects of engagement such as the positive effects of mastery in success vs. even similar concepts like mastering with a focus on ability that can have different levels of effect on well-being. Similarly, the importance of positive reinforcement suggests that there is large value to having more social support and resources in artistic and humanities-related activities, particularly in skill development. Art and humanities interventions and program organizers who intend to maximize the benefit for participants, therefore, can focus on how to increase more chances for such type of engagement to take place. In addition, some recent work has begun to examine how agentic development of creativity (Anderson et al., 2022) can lead to well-being, even during times of stress (Orbiki, 2021). This type of engagement with the AH is expected to predict sustained engagement and long-term flourishing, which is an exciting area for future research.

Immersion

While immersion was not the most important predictor for the flourishing outcomes, there were some subfactor differences in predictive

importance. Within immersion, the passage of time was not consistently predictive of flourishing outcomes, while effortless involvement was a consistent predictor of well-being when referring to engagement in both arts and humanities. This suggests that the experience of feeling that time stops during an engagement with the arts and humanities may be less relevant to long-term well-being outcomes and is perhaps more tied to more proximal physiological and psychological reactions or in-the-moment experiences (Fritz & Avsec, 2007; Hallam et al., 2014). However, feeling of distance from everyday problems and a feeling of effortless involvement may have added long-term benefits through the same means as reprise from daily problems and leisure can affect well-being (Newman et al., 2014).

Socialization

Socialization in arts and humanities was one of the most important variables predicting meaning in life, CIT, Civic Engagement, job satisfaction, positive affect, and interpersonal reactivity index. This makes sense since socialization opportunities through engagement in the arts and humanities allows individuals to build social bonds with others and find means to understand others, thereby increasing perspective-taking and empathy as measured by interpersonal reactivity index and subsequently increase pro-sociality and positive civic conduct as measured by Civic Engagement (Dodell-Feder & Tamir, 2018; Mumper & Gerrig, 2017). Developing social relations is also related to general health and well-being outcomes as measured by CIT, satisfaction, and affect measures. Overall, socialization has diverse well-being benefits for both the individual but also the community that they inhabit.

Expression

Finally, expression in arts and humanities most strongly predicted curiosity exploration: while expressive arts and humanities activities are popular in art and creative therapies which are meant to mitigate negative experiences (e.g., Puig et al., 2006; Travagin et al., 2015), expressive activities might also be effective in interventions focused on character or virtue enhancement, such as increasing someone's curiosity and openness to experience.

Other Psychological Mechanisms

The proposal of the RAISE psychological mechanisms does not preclude other perspectives and approaches to psychological mechanisms. There are other possible perspectives that bear on the types of mechanisms that can promote greater well-being in individuals. One approach is to consider momentary affective mechanisms that can lead to greater well-being. In this vein, some researchers have proposed the role of aesthetic emotions as a psychological process that links art and well-being (Mastandrea et al., 2019). Others have more broadly conceived the role of aesthetic experience, that comprises both affect and cognitions, in their role in promoting well-being (Brattico et al., 2013). While we see value in this momentary affective approach, especially from a neurophysiological perspective that examines immediate changes in the brain and physiology linked to longer-term well-being outcomes, we have approached it from a more phenomenological perspective; this is aligned with our methodological approach using self-report scales of subject's experiences and applying factor-analysis to elucidate the underlying dimensions. In addition, we have taken this approach to reduce the possible

confounding of the psychological mechanisms and well-being. In particular, because the affective mechanisms (e.g., aesthetic emotions, or discrete emotions associated with aesthetics like awe) are often construed positively (e.g., Chatterjee, 2011 ties aesthetics, or aesthetic experience, to pleasure), they may often be conceived of as immediate well-being outcomes in themselves. For example, there is a long tradition of including the experience of positive emotion states as part of subjective well-being (Diener et al., 1999). And indeed, positive emotion states, or immediate positive well-being, can be generative of longer-term well-being outcomes (Fredrickson, 2001). To exclude immediate well-being from our RAISE mechanisms, we have also tried to reduce content overlaps of our RAISE measures with positive emotion states. For instance, a reviewer asked whether elevation (Haidt, 2003) may be part of vicarious experience within the acquisition mechanism, but we would conceive as a well-being outcome rather than part of the acquisition mechanism.

Differences Between Arts and Humanities Engagement

Mechanisms related to engagement in the arts vs. humanities may also differentially predict flourishing outcomes. For instance, none of the dimensions of mechanisms underlying engagement in the humanities, with the exception of positive physiological response, were significant negative predictors of negative affect. This suggests that mechanisms of engagement in the humanities are more predictive of positive well-being than its absence or negation. This is surprising since past research on interventions such as expressive writing have been used to promote emotional regulation, and address trauma or negative emotions (e.g., Gortner et al., 2006) though some research on expressive writing as therapy found that it was most effective when positive emotion was the focus rather than venting negative emotions (Drake & Winner, 2012). Still despite the low amount of variance explained, expressiveness was overwhelmingly the most important variable for negative affect which supports some of the past findings. Future research could help investigate these relationships in more proximal terms to better understand them: for instance, expression in humanities may be more effective in reducing negative affect in-the-moment but not long term. Future research could help investigate these relationships in more proximal terms to better understand them: for instance, expression in humanities may be more effective in reducing negative affect in-the-moment but not long term.

The same was not the case for mechanisms of engagement in the arts: dimensions of immersion (effort), acquisition (experience of mastery—success, direct encouragement, and positive physiological response) in the arts were all significant negative concurrent and longitudinal predictors of negative affect, while expression and the social persuasion dimension of acquisition were significant negative concurrent predictors of negative affect and relationships dimension of socialization were significant negative longitudinal predictors. Similarly, while the r-square itself was quite low in the relative weights analysis results, acquisition explained the highest proportion of variance in negative affect followed by reflection and immersion. Therefore, those experiencing effortless immersion into art, feeling successful in their artistic pursuits, and receiving direct encouragement for their work may report lower negative emotional experiences in their daily lives. This is supported by the abundance of review and meta-analytic findings where artistic interventions have

been used to address negative affect and related concerns (Martin et al., 2018; Shim et al., 2021). At the same time, those who engage in artistic activities by reflecting on their experiences or acquiring skills through mastery in ability or vicarious experiences may not experience decrease in negative affect but still experience flourishing outcomes. Further research can delineate how each mechanism and its dimensions can have differential effects on individual experiences (beyond just well-being).

Limitations

This study utilizes Amazon Mechanical Turk which allows us to collect large samples that are often more demographically diverse than undergraduate student populations (Buhrmester et al., 2011; Casler et al., 2013). While there are some skepticisms about its use (e.g., truthfulness of the respondents, careless responding), many suggest that the responses from the platform are truthful (Rand, 2012). We tried our best to ensure potential issues could be mitigated by ensuring that we only recruit those have demonstrated history of good quality work (Peer et al., 2014) and pass attention check (Oppenheimer et al., 2009). In the future, it may be helpful to replicate the findings in diverse samples. We also did not specifically recruit participants who are heavily engaged in the arts and humanities. Future studies can specifically recruit for members of arts and humanities committees to better understand how these mechanisms affect well-being. Similarly, we do not report the type of engagement in the arts and humanities and what activities individuals are engaged in. Future research can report the pathways between different activities participants engage in and well-being outcomes through different mechanisms.

Conclusion

The scale RAISE can provide future opportunities for different forms of empirical design that could greatly benefit from an understanding of the mechanisms through which individuals engage with these activities. The mechanisms presented may be proximal processes—reactions or psychological experiences—due to involvement with the arts and humanities, which subsequently result in positive well-being outcomes. Future studies could use the scale to measure in-the-moment experiences in experience sampling or daily diary settings and operationalize the proximal processes. Similarly, for those who have experienced these on a trait level— for example, if they are highly reflective persons—the resulting well-being effects could be moderated by the individual's reflection. They may also change their forms of engagement over time through the process of self-reflection or outside feedback. Measuring changes in engagement mechanisms over time could help us understand this phenomenon. Future studies can explicate how these mechanisms on the individual and situational levels affect well-being outcomes. In addition, while we are limited in using self-reported engagement in the arts and humanities, the scale could be used in intervention settings as well as with physiological measures or well-being to overcome its potential mono-method self-reported bias.

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(*Appendices follows*)

Appendix

Mechanisms of Engagement in Arts and Humanities Scale—the RAISE Scale

Thinking about when you engage in the activities related to the [humanities/arts], please indicate the extent to which you agree with the following statements in general - that is on average across different forms of activities related to the [humanities/arts].

(1 = Strongly Disagree, 5 = Strongly Agree)

Immersion

When I engage in activities related to the [humanities/arts],

Passage of Time
1. I don't feel the passage of time
2. I feel that time stops
3. I don't feel how the time passes

Effortless Involvement
4. I can easily devote my whole attention to the activity
5. Once started, continuing the activity takes no effort
6. I am no longer worried about the challenges of everyday life

Reflection

When I engage in activities related to the [humanities/arts],

Internal—Life
1. I reflect on the philosophy of life
2. I think about the meaning of life
3. I look at my life in philosophical ways
4. I engage in philosophical or abstract thinking
5. I am deeply contemplative

Internal—Emotional
6. I savor past experiences
7. I take time to enjoy past positive feelings
8. I cherish the events of my life
9. I relive my past experiences
10. I relish past positive feelings

External—Others
1. I try to understand events from others' perspectives
2. I try to take other people's perspectives
3. I imagine how other people are thinking
4. I seek to understand other people's viewpoint
5. I make an effort to see the world through others' eyes

Expression

When I engage in activities related to the [humanities/arts],

1. I can authentically disclose my values and beliefs
2. I feel I am being authentic
3. I can easily reveal my true self
4. I can freely express my thoughts and emotions
5. I can easily communicate what I believe in

Acquisition

When I engage in activities related to the [humanities/arts],

Experience of Mastery - Ability
1. I develop new skills and abilities
2. I learn new abilities
3. I build new competencies and capabilities
4. I acquire experiences to master new techniques

Experience of Mastery - Skills
5. I feel competent
6. I feel that I do well in general
7. I feel a sense of accomplishment
8. I feel successful

Vicarious Experiences
9. I learn how to behave successfully by watching successful others
10. I develop confidence in my abilities by learning from the mistakes of others
11. Observing others pushes me to do better
12. I can picture myself to behave similarly to those around me
13. I discover new ways of behaving by observing others

Direct Encouragement
14. Others praise my skills
15. People tell me that I am skilled
16. Others tell me that I am talented
17. My competencies and capabilities are complimented
18. I am praised for my abilities

Social Persuasion
19. I am persuaded to face my challenges

(Appendices continues)

20. I receive valuable feedback from others that helps me improve
21. I am pushed to do better
22. I feel supported when needed
23. I find people who advocate for me

Positive Physiological Responses

24. I feel relaxed and calm
25. I feel free
26. I feel at ease

Socialization

My engagement in activities related to the [humanities/arts] allows me to.

Relationships

1. strengthen my current relationships
2. build deep relationships
3. maintain close relationships with others

4. develop warm and trusting relationships
5. feel closer to the people in my life

Conversation

6. engage in more meaningful conversations
7. have more interesting discussions with other people
8. get into deeper conversations with others
9. start inspiring discussions with other people

Identity

10. develop a sense of identity
11. broaden the identities that are important to me.
12. better understand who I am
13. have a more accurate reflection of myself
14. be satisfied with my identities