Creativity and well-being: a meta-analysis

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JOURNAL OF
Creative Behavior
Publication of the Creative Education Foundation™

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ABSTRACT

Creativity and well-being are popular subjects in psychological and organizational studies. The recent literature presented mixed perspectives about the nature of the relationship between the two. Whereas the mad-genius hypothesis, which was often explored among eminently creative individuals, seems to imply a negative relationship between the two, trends in the field of creativity, such as everyday creativity and general psychology (i.e., positive psychology) linked them positively. The present meta-analysis study synthesized 189 effect sizes obtained from 32 samples in 26 different studies based on a total sample of 8,189. Analyses with multilevel modeling yielded a mean effect of $r = .14$. The moderator analysis tested the impact of age, gender, measure of creativity, measure of well-being, stimulus type of creativity measure, and index of creativity measure. Only the creativity measure explained the variation in the study outcomes. The relationship between creativity and well-being was significantly higher when creativity was measured by instruments focusing on creative activity and behavior ($r = .22$) than the divergent thinking tasks ($r = .06$). Those findings are discussed in terms of theoretical and practical implications.

Keywords: creativity, well-being, mad-genius hypothesis, positive psychology.

Mostly defined as the production of novel and useful solutions, ideas, or products (Runco & Jaeger, 2012; Stein, 1953), creativity is a key human attribute that pushes our civilization forward. It serves as the seed to most scientific, technological, and social developments. Although this aspect of creativity is obvious and hard to denounce, creativity does not need to make such a big impact on a large scale to deserve such credibility and attention. The power of creativity lies in the fact that it is something that everyone possesses at varying levels and demonstrates it to a certain degree. It is the personal (Richards, 2007; Runco, 1996, 2007), everyday (Richards, 1990, 2007), little-c (Kaufman & Beghetto, 2009), or primary creativity (Runco & Beghetto, 2019) that benefits all regardless of the context or problem at hand (e.g., cooking, knitting, furniture design, and home decoration). This personal aspect of creativity is more critical to the well-being of the individual who engages in creative activity. In contrast, creativity that brings social recognition relates to the communal, economic, or societal prosperity and well-being. This study explores the relationship between creativity and well-being using a meta-analytical approach.

Well-being is a broad term. The World Health Organization (WHO) defined health in terms of the presence of well-being: "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity." The American Psychological Association's Dictionary of Psychology defines it as "a state of happiness and contentment, with low levels of distress, overall good physical and mental health and outlook, or good quality of life." (VandenBos, 2015, p. 1154) Although the absence of mental illness does not imply the presence of well-being (Keyes, 2012), there is converging evidence for the opposite link. For example, those with mood disorders had lower subjective well-being (Cramer, Torgersen, & Kringlen, 2010) and quality of life (Jansen et al., 2013). Similarly, a plethora of research (e.g., Hills & Argyle, 2001; Lauriola & Iani, 2015; Stewart, Ebmeier, & Deary, 2005) indicated the negative relationship between neuroticism and subjective well-being. In their meta-analysis, Ngabama, Panagioti, and Armitage (2017) reported a medium positive relationship between subjective well-being and health status.

There are at least two theoretical explanations about the connection between creativity and well-being. The first one is positive, and the second is negative.

THE POSITIVE CONNECTION

Personal, little-c, or everyday creativity must be one reason why humanistic psychologists paid great attention to the concept of creativity. From Maslow's perspective (1971), self-actualization (or "selfless actualization") could very much be the same or similar to creativity; or at least one facilitates the other. Rogers (1952) concurred that creativity is about the tendency to actualize oneself. Rogers (1959) also identified three inner and two outer conditions necessary for creativity. The inner conditions are openness to experience or "extensionality," locus of evaluation, and playing and toying with concepts and parts. The outer conditions include psychological safety and freedom. In their book, Courage to Create, May (1975) defined creativity as trying or encountering something new, something that did not exist; hence, it requires courage and commitment in the face of adversity.

Decades after the humanistic psychologists, a similar wave of movement emerged in the field of psychology known as "positive psychology" (Seligman & Csikszentmihalyi, 2000). Seligman and Csikszentmihalyi (2000) criticized that psychology, especially after the 1950s, focused on abnormality and healing psychological disorders, and neglected the idea of a satisfied person and a flourishing society. Positive psychology is "an attempt to urge psychologists to adopt a more open and appreciative perspective regarding human potentials, motives, and capacities" (Sheldon & King, 2001, p. 216). As a scientific study of human strengths and virtues, positive psychology called attention to positive emotions and characteristics such as happiness, joy, optimism, hope, courage, forgiveness, creativity, nurturance, and altruism (Seligman & Csikszentmihalyi, 2000; Snyder & Lopez, 2002). Peterson and Seligman (2004) developed Character Strengths and Virtues consisting of 24 strengths under six virtues (i.e., Wisdom & Knowledge, Courage, Humanity, Justice, Temperance, and Transcendence). Creativity was listed as a strength under the virtue of Wisdom & Knowledge. Seligman et al. (2005) underlined that they developed this framework to facilitate psychological well-being research, which is analogous to the function of the Diagnostic and Statistical Manual of Mental Disorders (DSM) for psychological disorders.

Humanistic and positive psychologists made critical conceptual and theoretical contributions to our understanding of creativity. Their contributions are relevant to the present investigation because they had such a positive perspective on creativity. From the perspective of humanistic and positive psychology, creativity and well-being are positively related, and creativity presents a pathway to psychological well-being and self-actualization.

THE NEGATIVE CONNECTION

Earlier perspectives on creativity reflect an understanding of creativity that is conflated with some myths. Isaksen (1987) featured four of these: madness, mystery, magic, and merriment. They reflect the beliefs that creativity requires craziness (madness or mad-genius hypothesis), it is difficult to understand (mystery), it occurs without an easily definable process (magical), and it does not often provide tangible benefits other than instantaneous fun (merriment). The most popular of these beliefs could be the mad-genius hypothesis (Becker, 1978; Jamison, 1996; Juda, 1949; Karlsson, 1970; Ludwig, 1992a, 1992b, 1998; Martindale, 1972). According to this perspective, creativity is associated with some degree of psychological abnormality. Empirical studies using different methodological approaches (e.g., clinical, psychometric, and historiometric) across various domains such as writing, arts, and sciences provided some support to this view (Andreasen, 1987; Jamison, 1989; Ludwig, 1994, 1998; Nettle, 2006; Post, 1996; Preti & Miotto, 1999; Simonton & Song, 2009). According to Carson (2011), creative individuals and those with psychopathology share certain vulnerabilities such as cognitive disinhibition, enhanced novelty salience, emotional liability, and hyper-connectivity. Consequently, creativity and well-being could negatively correlate from the perspective of the mad-genius hypothesis given that well-being tends to be lower among those with psychopathologies (Cramer et al., 2010; Hills & Argyle, 2001; Jansen et al., 2013; Stewart et al., 2005) and creativity is viewed as positively related to psychopathology (Andreasen, 1987; Jamison, 1989; Ludwig, 1994, 1998).

Some researchers challenged the mad-genius hypothesis and considered it a myth (Kaufman, 2014; Sawyer, 2012), and some others questioned the methodological quality of the presented empirical evidence (Dietrich, 2014; Rothenberg, 1990; Schlesinger, 2009). One of the criticisms about the mad-genius hypothesis is that most of the studies supporting this hypothesis rely on anecdotes or reports about eminent creators (cf. Barron, 1966). Consequently, those studies do not seem to represent the whole picture of the prevalence of psychopathology among people who practice creativity or make creative contributions to their fields (Dietrich, 2014; Schlesinger, 2009; Simonton, 2014a). In other words, the mad-genius hypothesis applies to a tiny group of eminent creators. Furthermore, there seems to be a bias that studies on eminent creators

tend to overestimate psychopathological symptoms in their reporting. It should also be noted that most people who share similar psychopathological vulnerabilities with well-known creators are not remarkably creative. Even among the historic eminent creators, the relation between creativity and madness differs significantly depending on the creative activity domain. For example, creators in the scientific domain are less likely to have psychopathology than eminent writers or poets (Simonton, 2014b). That is one reason why Simonton (2014c, 2019) also argued that the relationship between creativity and psychopathology could be positive and negative at the same time. Other reasons for this intricate relationship include measurement approach and level of creativity (everyday vs. eminent creativity).

Recent studies provided evidence that the relationship between creativity and psychopathology is indeed complex and non-linear. The nature of the relationship varies by the type of psychopathology, the specific domain of creativity, how creativity is measured and might be best characterized by an inverted-U relationship between the two (Abraham, 2015; Acar, Chen, & Cayirdag, 2018; Acar & Runco, 2012; Acar & Sen, 2013; Akiskal & Akiskal, 1988; Kinney et al., 2001; Richards, Kinney, Lunde, Benet, & Merzel, 1988; Schuldberg, 2000–2001; Simonton, 2014a, 2014b, 2014c). Those studies indicated that the relationship between the two is positive at the subclinical level of psychopathology and then disappears or turns to a negative relationship at clinical levels.

THE PRESENT STUDY

Although there is some empirical evidence supporting the link between creativity and psychopathologies (particularly among eminently creative individuals), connections between creativity and well-being are also well-documented (Chávez-Eakle et al., 2006; Peterson & Seligman, 2004; Wright & Walton, 2003). Admittedly, the mad-genius hypothesis applies mostly to eminently creative individuals and may not be appropriately generalizable to creative expressions across the board (Simonton, 2014a). The mad-genius hypothesis is relevant to the present study from the conceptual and theoretical standpoint. The empirical evidence coming from the eminent lives seems to have developed a public opinion that connects creativity more often to mental illness rather than well-being. Although it is possible to draw an inference from the mad-genius hypothesis about the nature of the relationship between well-being and creativity, there are counter accounts that emphasize the mitigating role of creativity against psychopathologies. According to this view, creativity could be a protective, mitigating, and even transformative factor channeling psychological abnormalities into optimal functioning (Simonton, 2000). Whereas the mad-genius hypothesis is helpful to understand the rationale behind the public opinion on the perception of creativity, this study does not aim to test it. It rather explored the connection between creativity and well-being.

The positive connection between creativity and well-being became more salient with the positive psychology movement (Compton & Hoffman, 2019; Seligman & Csikszentmihalyi, 2000). Creativity may be an effective way to support psychological adjustment (Russ, 1999) and promote optimum functioning (Runco, 2001). Ceci and Kumar (2016) asserted that creativity might accompany positive feelings, and creative people might show a greater happiness. Various studies remarked that certain psychological strengths that are closely associated with well-being (i.e., positive affect, flourishing, self-efficacy, life satisfaction, and happiness) seem to have a positive link with creativity (Conner, DeYoung, & Silvia, 2018; Goff, 1993; Tamannaeifar & Motaghedifard, 2014; Tan et al., 2019). Similarly, Amabile, Barsade, Mueller, and Staw (2005) found that creativity has a positive correlation with positive mood and creative thoughts have a positive correlation with positive affect and psychological adjustment.

Based on the empirical evidence, the present meta-analysis examined the hypothesis that creativity and well-being are positively related. This relationship may be influenced by several factors that were tested in the present meta-analysis through the moderator analyses. One such factor is gender. There is empirical evidence that mental illness is more particular to eminent female writers than male counterparts (Kaufman, 2001; Ludwig, 1994). The second moderator is the measure of creativity. It could explain the variability in the effect sizes because some are more cognitive (e.g., divergent thinking), whereas others are more behavioral (e.g., creative activity or behavior checklist). Another point of distinction is that some are self-report measures, and some are performance-based. Third, those creativity measures may vary in terms of their stimuli. They may be verbal, figural, or mixed, and could trigger somewhat different cognitive operations (Clapham, 2004; Richardson, 1986). Therefore, the test stimulus was tested as another moderator in the present study. Fourth, some creativity measures such as divergent thinking yield multiple indices or outcomes (e.g., fluency, flexibility, and originality), and they may have different correlations with well-being. Fifth, both well-being (Diener & Suh, 1998; Netz, Wu, Becker, & Tenenbaum, 2005) and creativity (Binnewies,

Ohly, & Niessen, 2008; Claxton, Pannells, & Rhoads, 2005; Simonton, 1975; Wu, Cheng, Ip, & McBride-Chang, 2005) are subject to variation by age. Therefore, we also tested age as another moderator.

Last, well-being was operationalized in different ways (Forgeard, Jayawickreme, Kern, & Seligman, 2011; Ryff, 1989; Thomas, 2009). The concept itself consisted of specific (e.g., affect and mood) and global (e.g., life satisfaction) aspects (Diener, Suh, Lucas, & Smith, 1999). Sometimes, well-being was measured in terms of the absence of negative qualities such as psychopathology or negative affect. Some (e.g., Herzlich, 1973; Westerhof & Keyes, 2010) argued that the lack of psychopathology does not necessarily imply the presence of well-being. Therefore, how well-being is operationalized matters and may influence the study outcomes.

All in all, the present meta-analysis examined the relationship between creativity and well-being. It tested the impact of the following moderators on the effect sizes: gender, age, the creativity measure, the creativity test stimulus, the index of creativity, and the measure of well-being.

METHOD

DATA SOURCES AND SEARCH STRATEGIES

Potential studies were located first through a keyword search. "Creativity" and "wellbeing" (and "well-being") were entered to the following databases: ProQuest, Google Scholar, Academic Search Complete, ERIC, PsychArticles, PsycINFO, PsychArticles, Science Direct, Social Sciences Citation Index, Web of Science, Dissertations & Theses A&I and Academic Search Complete (EBSCO). Then, the reference lists of the identified were screened. Last, unpublished works were solicited through networks of creativity scholarship.

INCLUSION AND EXCLUSION CRITERIA

Studies were only included if they were quantitative. All studies that were available until 2018 were included in the search. Besides this, studies were eligible for inclusion if they met the following criteria:

1. Studies must include the concepts of creativity and well-being explicitly. Studies that may measure an aspect of well-being such as "mood" but do not refer to the construct of well-being explicitly were not included. There are focused meta-analyses on mood or other-related topics (Baas, De Dreu, & Nijstad, 2008; Taylor, 2017); therefore, the scope of the present study was strictly limited to "wellbeing."
2. Sufficient statistics were necessary for inclusion. Studies that report Pearson correlation, descriptive statistics (mean, standard deviation, and sample size), or test statistics such as t test or F-test were included in the analyses.
3. Studies must include a measure of creativity and well-being for inclusion. The present study approached the relationship between the two from a domain-general perspective, whereas the domains could play a role similar to the creativity-psychopathology link (Simonton, 2014b). So, the relation of domain-specific creative activities (acting, dancing, painting, singing, etc.) to well-being was beyond the scope of the present study.

Our search identified 26 relevant studies that provide sufficient statistics based on the criteria listed above.

DATA CODING

Initially, data were coded by the second, third, and fourth authors. They used a coding sheet, including the study variables and moderators. In the first-round, raw information was coded for all study variables and moderators. Then, coders reviewed the coding of one another, and areas of discrepancy were resolved by conferring to the first author. Upon completion of the coding, moderator categories were determined by the first and second authors.

STUDY VARIABLES & MODERATORS

In the present study, we meta-analyzed the relationship between creativity and well-being. These two constructs were measured in a variety of ways. The Table S1 presents specific instruments used to measure these two constructs. They were categorized based on conceptual or structural similarities. Measures of creativity and well-being were two of the major moderators, and other moderators were also presented in the same table (Table S1). Creativity measure is the most frequently explored moderator in creativity research (Acar & Ogurlu, 2019). It is an important moderator because creativity measures vary greatly and thus they

may lead to inconsistent results across studies. Creativity measures were categorized as divergent thinking, creative activities and behaviors, and self-reports (See Table S1).

Some creativity measures, specifically divergent thinking tasks, yield multiple indices such as fluency, flexibility, originality, and elaboration, influencing the magnitude and direction of the relationship. Therefore, indices of creativity were used as another moderator. Another aspect of creativity assessment is the nature of the test stimulus. Some tests used verbal content, some included non-verbal stimulus, and others (self-reports) did not use a stimulus. Those three categories were tested as another moderator. Gender and age were coded as the sample-related moderators in the present study.

Well-being was measured in several ways. Some measures or subscales focused on social-emotional well-being, and others investigated interpersonal relations, general psychological well-being, and life satisfaction. Some studies measured well-being through psychological distress (e.g., stress and negative affect) absence or less of which were regarded as an indicator of well-being. Studies of this kind, which were presented as "negative" measures of well-being, were reverse coded by changing positive effect sizes to negative and vice versa. Measures that did not belong to any of these categories were coded as "other."

THE CALCULATION OF EFFECT SIZES

The present study used Pearson correlation (r) as the effect size metric. Most studies directly reported Pearson correlations, and the studies reporting descriptive statistics were converted to Pearson r. As suggested by Borenstein, Hedges, Higgins, and Rothstein (2009), Pearson correlations are not normally distributed and were converted to Fisher's Zr for the analyses. The results were reported as Zr values in the results section, and Table 3 included both Zr and back-transformed Pearson r values. Analyses used Fisher's Zr along with a weight (w) term, which is equal to N-3, to account for small sample bias (Lipsey & Wilson, 2001).

STATISTICAL ANALYSES

The present study used a combination of meta-regression and multilevel approaches. It is typical in creativity research that multiple effect sizes are obtained from a single sample, and the effect sizes that come from a single sample are dependent. To control for this dependency, researchers suggested adopting a multilevel approach (Cheung, 2014; Hox, 2002; Konstantopoulos, 2011; Scammacca, Roberts, & Stuebing, 2014; Stevens & Taylor, 2009; Van den Noortgate, López-López, Marín-Martínez, & Sánchez-Meca, 2013). A specific adaptation of the multilevel modeling to meta-analysis is called *Level 1 Variance Known model* (Bryk & Raudenbush, 1992). In the present study, Level 1 represents variation due to sampling error (i.e., within-effect size), Level 2 represents the variation of the effect sizes within the same sample, and Level 3 represents variation between the samples. The mean effect sizes were calculated based on this unconditional multilevel model without any predictors (i.e., moderators in the context of meta-analysis).

We used meta-regression to reduce the probability of Type 1 error by adding all study moderators as the predictors of variability in the effect sizes. Except for gender and age, which are Level 3 moderators, all moderators were at Level 2. After the unconditional model, which provided an overall mean effect size, the full model included all study variables. Follow-up analyses were then conducted for moderator categories by using the unconditional model.

THE ASSESSMENT OF PUBLICATION BIAS AND HETEROGENEITY

The potential publication bias, also known as the file-drawer effect, was tested with Rosenthal's (1979) fail-safe test, Egger's (Egger, Smith, Schneider, & Minder, 1997) regression test, and Begg's (Begg & Mazumdar, 1994) rank correlation. Rosenthal's fail-safe test calculates an estimate of the number of studies needed to nullify significant effects. The larger the fail-safe N number, the smaller the file-drawer effect. Egger's regression test examines the funnel plot asymmetry by assessing the correlation between the magnitude of the effect size and the study sample. Begg's rank correlation test is another way to test funnel plot asymmetry by comparing the correlation between the ranks of effect sizes and their ranked variances. Heterogeneity was assessed with Cochran's heterogeneity statistic (QT), which is distributed as distributed as a chi-square statistic, as well as I^2 statistic that provides a percentage value of heterogeneity where values closer to 100 imply high heterogeneity (Higgins et al., 2003).

RESULTS

Analyses used 189 effect sizes obtained from 32 samples in 26 different studies. The total sample size was 8,189. Included studies were presented with asterisks (*) in references. Figure 1 displays the distribution of

Fisher's z transformed values of effects size r. The possibility of a publication bias was then explored. Egger's regression test, $t(187) = -0.32$, $p = .75$ and Begg's rank correlation ($r_\tau = .00$, $p = .99$) were not significant. The fail-safe N based on Rosenthal's (1979) formula is 93,622. So, publication bias seems quite unlikely for the present results.

Based on a three-level Level-1 variance-known unconditional model with no moderators, the mean effect size $Zr = .141$, $SE = .027$, $p < .001$. When this value was transformed back to Pearson r, the mean effect size was .140. This three-level model found significant Level 2 and Level 2 variances (See Table 1), showing that effect sizes were heterogeneous, and there was a significant variation across different samples. The unconditional model yielded the mean effect size controlling variation at these two levels. When data were assumed independent, heterogeneity was again significant, $Q_T\ (188) = 2{,}015.81$, $p < .001$, ($I^2 = 90.67\%$).

Moderators were then added to see if they could explain variation (heterogeneity) in the effect sizes. We created dummy coded variable sets for categorical variables and added them to the model along with age, which was the only continuous moderator variable. The model results were presented in Table 2. As the model results indicated, only one moderator, which is creativity measure, was significant. Creativity measure had three categories: Divergent thinking, self-reports, and creative activity or behavior. Creative activity or behavior was selected as the reference group and studies measuring creativity via self-reports had significantly lower mean effect size ($b = -.198$, SE = .052, $t = -3.80$, $p < .001$) than those using creative activity or behavior. Then, the mean effect sizes for each of these category levels showed that the effect size was lowest when creativity was measured with divergent thinking tasks ($r = .055$, $k = 62$, $p = .317$), highest with creative activity or behavior ($r = .220$, $k = 43$, $p = .005$), and self-report measures were in between ($r = .173$, $k = 84$, $p = .001$). The mean effect sizes were presented for all categories in Table 3.

DISCUSSION

The present meta-analysis compiled studies that explored the relationship between creativity and well-being. Although the number of non-empirical works outnumbered empirical studies, the number of available quantitative studies ($n = 26$) provided a substantial number of effect sizes ($k = 189$) from 32 samples. As multiple effect sizes were obtained from a single sample, we controlled the dependency among the effect sizes from the same sample using a specific version of a 3-Level model known as Level-1 Variance Known Model. The overall mean effect size was $r = .140$, $p < .001$. These findings indicate that there is a significantly positive, yet modest, relationship between creativity and well-being.

```
Frequency    Stem & Leaf

   2.00 Extremes   (=<-.51)
   2.00      -4 .  03
   1.00      -3 .  5
   7.00      -2 .  0013468
   8.00      -1 .  00011125
  18.00      -0 .  000011223345567788
  44.00       0 .  000011111122223334444555566677777777888899 99
  29.00       1 .  00000111112222334445555677899
  27.00       2 .  011111222222345555555567778
  24.00       3 .  012233345566666777888899
  10.00       4 .  0023333679
   8.00       5 .  01237777
   4.00       6 .  0004
   2.00       7 .  26
   3.00 Extremes    (>=.89)

  Stem width:      .10
  Each leaf:       1 case(s)
```

FIGURE 1. A stem-and-leaf plot of correlations (Zr) between well-being and creativity.

TABLE 1. Parameter Estimates for Unconditional Model

	Estimates	*SE*	*t*
Fixed Effects			
Intercept	0.141**	0.027	5.25
Variance Components			*Z*
Second Level	0.034**	0.005	7.12
Third Level	0.013*	0.006	2.13

Note. The mean effect size was calculated based on Fisher's *z*. *$p < .05$; **$p < .01$.

TABLE 2. Parameter Estimates for Full Model with All Moderators

	Estimates	*SE*	*t*
Fixed Effects			
Intercept	0.222*	0.108	2.05
Gender1 (Female vs. Mixed)	−0.120	0.076	−1.58
Gender2 (Male vs. Mixed)	−0.011	0.101	−0.11
Age	0.001	0.002	0.65
Creativity measure1 (DT vs. Creative activity)	−0.149	0.093	−1.61
Creativity measure2 (Self-report vs. Creative activity)	−0.198**	0.052	−3.80
Index1 (Originality vs. Unspecified)	−0.031	0.106	−0.30
Index2 (Elaboration vs. Unspecified)	−0.163	0.121	−1.35
Index3 (Flexibility vs. Unspecified)	−0.016	0.106	−0.16
Index4 (Fluency vs. Unspecified)	0.131	0.106	1.24
Test Stimulus1 (Verbal vs. Unspecified)	0.157	0.077	1.80
Test Stimulus2 (Non-verbal vs. Unspecified)	−0.154	0.108	2.05
Well-being criteria1 (Socio-emotional vs. Other)	−0.040	0.073	−1.43
Well-being criteria2 (Negative vs. Other)	0.042	0.055	−0.54
Well-being criteria3 (Life satisfaction vs. Other)	0.053	0.046	0.76
Well-being criteria4 (Relations vs. Other)	0.053	0.060	1.15
Well-being criteria5 (Health vs. Other)	−0.019	0.059	0.89
Well-being criteria6 (Psychological vs. Other)	−0.052	0.097	−0.32
Variance Components			*Z*
Second Level	0.030**	0.004	6.83
Third Level	0.013*	0.007	1.93

Note. * $p < .05$; **$p < .01$.

This finding may be interpreted in at least two ways: (a) Creative people tend to have higher well-being; (b) Those with higher well-being tend to be more creative. Creative people may indeed have higher well-being because creativity can entice a positive mood and improve well-being. Creative thinking and activity play a crucial role in the self-actualization of creative potential. People may be feeling better when they express themselves creatively and explore and demonstrate their creative self (Maslow, 1974; May, 1975). Fisher and Specht (1999) interviewed senior artists and found that creative activity facilitates successful aging because it builds a sense of purpose, competence, and personal growth. Engaging in such activities may elevate self-confidence, boost morale, and let creative people set higher and meaningful goals for themselves (Holt, 2005, 2008; McNiff, 1992; Ulrich, 1992; Webster, Clare, & Collier, 2005). Leckey (2011) conducted a literature review of studies on the impact of engaging creative arts on well-being and found such activities may enhance mental health. Importantly, Leckey (2011) noted that their conclusions are limited by a lack of conceptual clarity and specific activities in the reviewed studies. More importantly, such activities sometimes took place as social events (Greaves &

TABLE 3. Mean Effect Sizes for Moderator Categories

Moderator Categories	ES (Z*r*)	*ES (r)*	*k*	*CI* 95%	*p*	*Q*	I^2
Gender – female	0.087	0.087	49	−0.008, 0.182	.107	227.60**	78.91%
Gender – male	0.079	0.079	16	−0.060, 0.218	.400	127.18**	88.21%
Gender – mixed	0.174	0.172	124	0.102, 0.246	<.001	1,578.71**	92.21%
Creativity measure - divergent thinking	0.055	0.055	62	−0.046, 0.157	.317	367.01**	83.38%
Creativity measure - creative activity & behavior	0.224	0.220	43	0.154, 0.294	.005	639.61**	93.43%
Creativity measure - self-report	0.175	0.173	84	0.096, 0.254	.001	858.19**	90.33%
Index - originality	0.096	0.096	13	−0.199, 0.391	.585	80.88**	85.16%
Index - flexibility	0.119	0.118	13	−0.131, 0.369	.444	77.31**	84.48%
Index - elaboration	−0.064	−0.064	7	−0.359, 0.231	.711	29.02**	79.32%
Index- fluency	0.321	0.310	13	0.133, 0.509	.008	125.77**	90.46%
Index - other	0.137	0.136	143	0.074, 0.200	<.001	1,608.34**	91.17%
Stimulus - verbal	0.228	0.224	91	0.151, 0.304	.001	1,042.30**	91.37%
Stimulus - non-verbal	0.021	0.021	14	−0.155, 0.197	.830	39.74**	67.29%
Stimulus – mixed or other	0.120	0.119	84	0.062, 0.178	<.001	755.01**	89.01%
Well-being - socio-emotional	0.149	0.148	17	0.012, 0.286	.088	114.75**	86.06%
Well-being - negative	0.178	0.176	26	0.063, 0.293	.006	322.07**	92.24%
Well-being - life satisfaction	0.133	0.132	47	0.024, 0.242	.029	481.24**	90.44%
Well-being - relations	0.235	0.231	15	0.152, 0.318	.023	89.00**	84.27%
Well-being - psychological	0.145	0.144	9	−0.008, 0.182	.008	7.10	0%
Well-being - health	0.200	0.197	14	−0.095, 0.495	.051	110.59**	88.24%
Well-being - other	0.160	0.159	61	0.086, 0.233	.002	747.07**	91.97%
General	0.141	0.140	189	0.088, 0.194	<.001	2,015.81**	90.67%

Note. * $p < .05$; ** $p < .01$.

Farbus, 2006). It is difficult to determine whether it is the creative activity or social engagement that leads to superior well-being. Therefore, future studies may investigate the impact of creative activities in solitude and with others.

Richards (2007) emphasized the importance of everyday creativity because it leads to well-being, although the activity itself may not change others' lives immensely. The primary benefit of everyday creativity is for the individual engaging in it. Conner et al. (2018) examined the impact of everyday creativity on well-being. They asked participants to report how they feel, how much they engaged in creative activity, and flourishing. They found that participants reported greater positive affect and flourishing following the day they engaged in creative activity. Still, they were not necessarily more creative after the days they reported higher positive affect and flourishing. Although the results of the lagged design did not find a positive impact of well-being on creativity when creativity was observed on the following day, Conner and Silvia (2015) found that creativity was greater than on the days people felt more excited, energetic, and enthusiastic. It may be that the positive affect impacts creativity for a short period, whereas creativity generates positive affects for longer (at least until the next day). It is also important to note that affect is just a component of well-being. There is more to well-being than affect, such as global aspects, including life satisfaction (Diener et al., 1999).

One way in which well-being enhances creativity is through positive mood and affect. The link between creativity and positive affect is well-established. This interpretation is consistent with research showing the positive relationship between creativity and positive mood (Baas et al., 2008; Davis, 2009). Interestingly, positive mood is more beneficial to creativity than neutral mood, whereas negative mood is bad only under some circumstances. A negative mood can diminish cognitive flexibility while enhancing fluency and diminishes creativity when accompanied by avoidance motivation and prevention focus, such as fear and anxiety. People have a more open mind when they feel happy, whereas fear, stress, and ambiguity may lead to

apprehension from creativity (Lee, Chang, & Choi, 2017; Mueller, Melwani, & Goncalo, 2012). Davis (2009) also found that a positive mood is primarily influential for ideational tasks, whereas a negative mood may help with the problem-solving tasks that include evaluative processes. Davis identified a curvilinear relationship between mood intensity and creativity where the highest level of creativity was observed with a moderately intense mood.

Some of findings in the present study seem to further challenge the applicability of the mad-genius hypothesis to the general population. The mad-genius hypothesis would propose lower well-being with higher creativity as creativity is associated with some level or type of mental illness. This line of thinking is further supported by the negative relationship between well-being and psychopathologies (Cramer et al., 2010; Hills & Argyle, 2001; Jansen et al., 2013; Lauriola & Iani, 2015; Stewart et al., 2005). Despite some supportive evidence for the creativity-psychopathology relationship (Andreasen & Glick, 1988; Andreasen, 1987; Jamison, 1996; Ludwig, 1995) and theoretical accounts to justify this link (Carson, 2011; Simonton, 2010, 2014a), recent meta-analyses found a positive relationship at subclinical levels (Acar & Runco, 2012; Acar & Sen, 2013) and negative relationship between creativity and schizophrenia (Acar et al., 2018). Paek et al. (2016) found no support for a link between little-c creativity and ADHD, anxiety, and depression. In some of the studies included in the present study, well-being was operationalized in terms of the presence of some negative qualities such as negative affect or psychopathology. The mean effect size is generalizable to those findings because the measure of well-being was not a significant moderator (See Table 2). Admittedly, the present study did not test the mad-genius hypothesis and other studies including the meta-analyses cited above provide stronger empirical evidence on this issue. Our inferences regarding the mad-genius hypothesis rely mostly on the direct evidence from the specific studies involving negative measures of well-being such as negative mood, negative affect, or psychopathology.

Those results indicate that the relation of creativity to well-being is evident yet less emphasized than the mad-genius hypothesis. There may be a few reasons for it. First, mad-genius is "interesting" to discuss. It attracts public and journalistic attention. Some unusual moments and feelings of famous individuals may have led to the salience effect (Jones & Nisbett, 1972), where selective scholarly attention paid more attention to what is atypical. Some of the studies reporting the mad-genius hypothesis were criticized in terms of methodological soundness, and therefore, the generalizability of such findings is highly questionable (Rothenberg, 1990; Schlesinger, 2009). Second, it fits with the prevalent deficit mindset in the field of psychology (Seligman & Csikszentmihalyi, 2000) and older views of creativity that recognized creativity as related to madness (Isaksen, 1987).

The second important finding is that the type of creativity measure was a significant moderator (See Tables 2 and 3), and the mean effect size was higher with creative activities and behavior (r = .22) and self-reported creativity (r = .17) than divergent thinking (r = .06). Divergent thinking tasks are often used to measure creative potential (Acar & Runco, 2012), yet they do not guarantee or require creative activity or creative achievement. Divergent thinking is primarily a cognitive measure, whereas the measures of creative activity and behavior are more behavioral, goal-oriented, and motivational. Divergent thinking is more aligned with creative potential, and creative activity is more aligned with creative performance (Runco, 2007). Well-being is more likely to be achieved when someone takes concrete steps toward their goals and witnesses the outcome of their own creative activity. The stronger relation of creative activity or behavior to well-being than creative ideation has implications for organizations because engaging in creative activities benefits to the organizations through enhancing innovation and effective problem-solving behaviors as well as the well-being of the organization's people. Creative activity and behavior go beyond ideational creativity, and it often incorporates physical action and exercise, which are predictive of well-being (Netz et al., 2005). Therefore, future studies may investigate whether creative activity leads to superior well-being than any other physical routine activity alone. This finding also calls for future meta-analyses that examine the relationship between well-being and engaging in a specific domain of creative activity such as writing, painting, and composing and well-being.

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AUTHOR NOTE

The project has started at lead author's prior institution, SUNY Buffalo State, and was finalized at the current institution.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table S1 Definitions and scope of the moderators.