

Depressive Anhedonia and Creative Self-concepts, Behaviors, and Achievements

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Abstract:

In the large literature on creativity and mental illness, relatively few studies have explored anhedonia—impairments in anticipating, seeking, and experiencing rewards. This project explored self-reported creativity in a sample of adults who differed in depressive anhedonia, determined via face-to-face structured clinical interviews. Participants completed measures of everyday creativity (engaging in common creative behaviors and hobbies), creative self-concepts (creative self-efficacy, creative personal identity, and self-rated creativity in different domains), and creative achievements. Compared to the control group (n=52), people in the anhedonia group (n=22) had significantly higher engagement in little-c creative activities (medium effect size). Effect sizes for self-rated creativity and creative achievement were either small or near-zero. Taken together, the findings suggest that anhedonia deserves more attention in future research on motivational aspects of creativity.

Keyword: anhedonia | depression | creativity | creative identity | creative self-efficacy | creative achievement

Article:

The intersection of creativity and mental illness has proven to be both controversial and fertile. The past decade has seen enormous growth in both conceptual models and empirical studies on different disorders, populations, and forms of creativity (Kaufman, 2014; Kyaga, 2015; Simonton, 2019). At this point, the literature is large enough to have prompted several meta-analyses that focused on different disorders, populations, and forms of creativity (Acar & Sen, 2013; Baas, Nijstad, Boot, & De Dreu, 2016; Paek, Abdulla, & Cramond, 2016; Taylor, 2017).

This literature sorts into three sampling strategies that yield different inferences (Silvia & Kaufman, 2010). Many studies recruit broad, unselected samples and evaluate the covariance of psychopathology symptoms and creativity (e.g., estimate correlations with scores on creativity scales and symptom scales; Zabelina, Condon, & Beeman, 2014); other studies recruit samples based on creativity and compare them on mental health outcomes (e.g., poets, artists, and non-artistic controls; Nettle, 2006), and some studies recruit samples based on mental health criteria and compare them on creative outcomes (e.g., adults with or without an ADHD diagnosis; White & Shah, 2016). These last two designs represent different conditional probabilities—the probability that someone has mental health issues given that they are creative ($P(A|B)$) versus the probability that someone is creative given that they have mental health issues ($P(B|A)$)—that afford different claims and conclusions (Taylor, 2017). It is possible, for example, to find that people with a given disorder have a high probability of being creative while also finding that people who are creative have a low probability of having that disorder (Silvia & Kaufman, 2010).

By far, sampling based on mental health criteria is the least common design, largely because of the resource-intensive nature of recruiting clinical samples. In the present research, we add to this small cluster of studies by recruiting participants with clinically significant anhedonia—impairments in anticipating, seeking, and experiencing rewards (Shankman et al., 2014). Anhedonia appears in many forms of psychopathology, but it is central to depression. Along with depressed mood, loss of interest or pleasure is a cardinal symptom of major depressive disorder. In the present work, we use the term anhedonia primarily in the context of depression.

To date, anhedonia has received relatively little attention in creativity research, but it has interesting connections. Because anhedonia reflects a disordered positive affect system (Watson, 2000), the core expression of anhedonia is diminished reward responsiveness: Anticipated goals do not seem as alluring and appealing, and attained rewards do not seem as gratifying and satisfying (Treadway & Zald, 2011). At clinical levels of severity, anhedonia manifests as significant disinterest in normally appealing things and thus affects processes connected to making decisions, selecting goals, and persisting versus quitting (Eddington et al., 2017; Eddington, Silvia, Foxworth, Hoet, & Kwapil, 2015; Treadway, Bossaller, Shelton, & Zald, 2012).

The notion of impaired reward responsiveness has intriguing intersections with several theories and bodies of work in creativity. Many models of creativity are motivational, such as creativity as a form of approach motivation (Baas et al., 2016) and creativity as a process involving goal-seeking, confidence beliefs, and emotion regulation (Benedek, Bruckdorfer, & Jauk, 2020; Karwowski & Beghetto, 2019; Karwowski & Lebeda, 2017). In these models, the creative process is largely appetitive and approach-oriented, in which people engage appetitive motivation and positive emotions to pursue creative goals and to serve as counterweights to negative emotions like anxiety and frustration (Ivcevic & Hoffmann, 2017). These models have many differences, but none would see reduced sensitivity to rewards and diminished approach motivation as a context for greater creative activity. A related body of work examines the reciprocal links between pursuing creative goals and positive affect. Experience sampling and daily diary studies consistently find that spending time on creative activities is associated with heightened positive affect (Conner, DeYoung, & Silvia, 2018; Conner & Silvia, 2015; Karwowski, Lebeda, Szumski, & Firkowska-Mankiewicz, 2017; Silvia et al., 2014), particularly the activated positive states—feelings of liveliness, excitement, and energy—that are the opposite of anhedonia (Watson, 2000).

Findings from recent meta-analyses offer limited guidance on how depressive anhedonia might predict creativity. Research syntheses of creativity and depression have not isolated specific effects of anhedonia, given the dearth of primary studies, and the effects for depression appear

small and inconsistent. In their meta-analysis of mental health and “little-c” creativity, Paek et al. (2016) found a very small positive effect size for depression ($r = .04$) on creative outcomes. In their analysis of clinical and non-clinical samples for a wide range of creative outcomes, however, Baas et al. (2016) found a very small negative effect size for depression ($r = -.06$). In a well-conceived meta-analysis, Taylor (2017) structured the analyses according to sampling design, allowing distinct tests of the different questions they pose. In the sample of studies that selected for mood disorders and evaluated creativity—the third main design—there was a small but positive effect (Hedges’s $g = .08$). The sample size for studies on major depression, however, was small ($k = 5$), and the subsample did not afford isolating depressive anhedonia.

In the present research, we explored differences in creativity in a sample of adults who differed in depressive anhedonia, determined via face-to-face structured clinical interviews. As part of a broader study on anhedonia and motivation (Silvia et al., 2020a,b), we included self-report scales that assessed creative self-efficacy and identity (Karwowski, Lebuda, & Wisniewska, 2018), self-rated creativity in different domains (Kaufman, 2012), everyday “little-c” creative behaviors (Batey, 2007; Dollinger, 2003), and creative achievements (Carson, Peterson, & Higgins, 2005). Time constraints precluded performance measures, such as divergent thinking or humor production, but self-report measures of creativity offer a well-rounded view of people’s creative self-concepts—how they construe their creative abilities, skills, and experiences (Karwowski & Lebuda, 2017)—and their past creative behaviors and achievements (Kaufman, 2019; Silvia, Wigert, Reiter-Palmon, & Kaufman, 2012). Our approach was essentially exploratory, so we had no specific predictions.

Method

Participants

Participants were recruited from the local area via print and online ads and flyers distributed around the neighboring cities and college campuses. A final sample of 78 people took part in the study. Detailed information about recruitment, screening, and demographics is provided in the Online Supplemental Material (OSM). The sample was young ($M = 23.26$ years, $SE = .61$, range = 18 to 43), largely female ($n = 59$, 76%), and diverse (47% African American, 36% European American, 12% Hispanic/Latinx, and 6% Asian American; people could select several or no categories).

Procedure

Clinical Interview

Participants completed a structured clinical interview administered by trained clinical psychology graduate students using select modules of the Structured Clinical Interview for DSM disorders (SCID-5-RV: First, Williams, Karg, & Spitzer, 2015; SCID-II: First, Gibbon, Spitzer, Williams, & Benjamin, 1997). Because the DSM-5 SCID version was released mid-project, the first 21 participants were interviewed with the SCID-IV-TR; there were no substantive differences for our purposes.

Participants were ineligible if they reported any past manic or hypomanic symptoms, reported any clinically significant psychotic symptoms, reported current substance abuse or

dependence, had active suicidal ideation, or met diagnostic criteria for antisocial or borderline personality disorder. Notably, participants were ineligible if they had taken antidepressants within the past 8 weeks. Finally, the participants were in good physical health and not currently taking medications that modified autonomic influences on the cardiovascular system, an exclusion that was necessary for physiological data collected as part of the larger study.

Based on the clinical interview, anhedonic symptoms were ruled “absent” in 56 (71.8%), “subclinical” in 4 (5.1%), and “present at clinical levels” in 18 (23.1%). The subclinical and clinical levels were combined, yielding 22 participants in the depressive anhedonia group (28.2%) and 56 participants in the control group (71.8%). Of the 78, major depressive disorder (MDD) was ruled “present” in 18 (22.4%) and “not present” in 60 (77.6%). As expected, the anhedonia and MDD groups largely overlapped. Of the 22 people in the anhedonia group, 17 (77.3%) had concurrent major depressive disorder (MDD). Stated differently, almost everyone with MDD (17 of 18) was in the anhedonia group; most of the people in the anhedonia group (17 of 22) were also in the MDD group.

Creativity Assessment

The creativity assessments were completed during an individual laboratory session that lasted 2 hours. Along with cognitive tasks examining effort (e.g., Silvia et al., 2020b), participants completed self-report scales assessing different aspects of creativity. These tasks were selected to capture two main facets of creativity that are amenable to self-report assessment: people’s creative behaviors and people’s beliefs about their creativity. For people’s behaviors, the scales covered both common, everyday behaviors (the BICB and CBI), and significant achievements (the CAQ). For personal beliefs, the scales offered a broad look at people’s appraisals of their creativity (the KDOCS) as well as focused confidence beliefs about creativity (the SSCS) that are rooted in social-cognitive models of motivation (Bandura, 1997; Karwowski & Beghetto, 2019). All the scales are available at OSF (<https://osf.io/4s9p6/>).

Everyday Creative Behaviors

Everyday creative behaviors were measured with two scales that focus on common, “little-c” creative activities (Kaufman & Beghetto, 2009). First, the Biographical Inventory of Creative Behaviors (BICB; Batey, 2007) presents 32 items representing a range of creative activities (e.g., “Produced your own food recipes” and “Choreographed a dance”) and asks whether the respondent has done them in the past year. People respond with a No/Yes (coded 0/1) scale. The items were averaged to create a proportion score ranging from 0 to 1. Second, the short form of Hocevar’s (1979) Creative Behavior Inventory developed by Dollinger (2003) has 28 items that focus on the domains of arts, crafts, music, and writing (Silvia et al., 2012). People respond using a 4-point scale that expresses how often they have done an activity (e.g., “Made a sculpture” and “Designed and made a piece of clothing”), ranging from 0 (Never did this) to 3 (More than 5 times). The items were averaged to form an overall score. The BICB and CBI overlap, but the BICB offers greater breadth and the CBI offers greater depth into artistic domains that are common creative hobbies.

Creative Self-Beliefs

Creative self-efficacy and creative personal identity, two key aspects of the creative self-concept (Karwowski & Lebuda, 2017), were measured with the Short Scale of Creative Self (SSCS; Karwowski et al., 2018). This scale has 6 items for creative self-efficacy (e.g., “I trust my creative abilities”) and 5 items for creative personal identity (e.g., “Being a creative person is important to me”). People respond with a 5-point scale (1 = Definitely not, 5 = Definitely yes). This scale has been widely used in studies of creative self-concepts (e.g., Karwowski & Lebuda, 2016; Karwowski, Lebuda, Wisniewska, & Gralewski, 2013; Snyder, Sowden, Silvia, & Kaufman, 2020), and it captures two key motivational concepts that influence people’s creative goals and decisions.

We assessed beliefs about one’s own creativity using the K-DOCS (Kaufman, 2012), which asks people to self-evaluate their creativity (relative to people of their age and life experience) for 50 different activities on a 5-point scale (1 = much less creative, 5 = much more creative). The activities sort into 5 domains: Artistic (e.g., “Sketching a person or object”), Mechanical/Scientific (e.g., “Taking apart machines and figuring out how they work”), Performance (e.g., “Playing music in public”), Scholarly (e.g., “Coming up with a new way to think about an old debate”), and Self/Everyday (e.g., “Choosing the best solution to a problem”). This scale has been widely used to study people’s beliefs about their own creativity (McKay, Karwowski, & Kaufman, 2017).

Creative Achievement

Creative achievement was measured with the Creative Achievement Questionnaire (CAQ; Carson et al., 2005), a popular scale for measuring high-level creative achievements in 10 domains. Because CAQ scores have substantial positive skew (Silvia et al., 2012), a handful of cases with high values will be highly influential in small samples like this one, particularly for the 10 basic domains. We thus focused our analysis on the CAQ total score (the sum of all 10 domains) and on the Arts (sum of visual arts, music, dance, creative writing, humor, and theater) and Sciences (sum of inventions and scientific discovery) subscales proposed by S. B. Kaufman et al. (2016).

Results

The data were screened and coded using R 4.0 and analyzed in Mplus 8.1. Four participants (all in the control group) were dropped because of high scores on an infrequency scale that catches inattentive and careless responding (e.g., endorsed several items like “I sometimes eat cement”; McKibben & Silvia, 2017). We compared the anhedonia and control groups using regression models estimated with maximum likelihood with robust standard errors, which correct somewhat for biasing effects of non-normality. Each model had anhedonia as a predictor and one or more outcomes, as detailed below. Because the predictor is categorical (control = 0, anhedonia = 1) and the outcomes are continuous, we report Y-standardized regression coefficients. These represent the difference, in the outcome’s SD units, between the two groups (Long, 1997), so the regression coefficients are effect sizes in the Cohen’s *d* metric (small = .20, medium = .50, large = .80; Cumming, 2012).

Table 1 displays the descriptive statistics for all outcomes. Readers interested in effects based on MDD groupings can find tables, figures, and analysis results in the OSM. The data and input files are posted at OSF (<https://osf.io/cqnyt/>).

Table 1. Descriptive Statistics

Outcome	Anhedonia			Control		
	M (SD)	Median	Min, Max	M (SD)	Median	Min, Max
BICB	0.31 (0.18)	.28	0.09, 0.85	0.24 (0.12)	.24	0.00, 0.56
CBI	0.67 (0.50)	.57	0.07, 2.21	0.43 (0.31)	.41	0.00, 1.14
SSCS Self-efficacy	3.95 (0.53)	4.00	3.00, 4.83	3.93 (0.58)	4.00	2.33, 5.00
SSCS Identity	4.07 (0.92)	4.40	2.00, 5.00	3.72 (0.90)	3.90	1.80, 5.00
K-DOCS Artistic	3.20 (0.88)	3.17	1.78, 4.67	3.11 (0.72)	3.17	1.78, 4.56
K-DOCS Mechanical/Scientific	2.44 (0.82)	2.17	1.22, 4.33	2.36 (0.74)	2.33	1.00, 4.33
K-DOCS Performance	2.94 (0.90)	3.10	1.00, 4.60	2.72 (0.84)	2.80	1.00, 5.00
K-DOCS Scholarly	3.24 (0.38)	3.36	2.55, 3.73	3.25 (0.67)	3.36	1.36, 4.64
K-DOCS Self/Everyday	3.64 (0.51)	3.73	2.45, 4.64	3.79 (0.56)	3.82	1.64, 4.82
CAQ Total	16.14 (19.03)	10.50	0, 87	12.73 (17.77)	7.50	0, 113
CAQ Art Subscale	13.41 (18.34)	9.50	0, 86	10.77 (16.86)	6.00	0, 106
CAQ Science Subscale	2.18 (7.15)	.00	0, 32	1.23 (4.25)	.00	0, 23

Note: Sample sizes are $n = 22$ (Anhedonia) and $n = 52$ (Control). The raw CAQ scores are presented. BICB = Biographical Inventory of Creative Behaviors; CAQ = Creative Achievement Questionnaire; CBI = Creative Behavior Inventory; K-DOCS = Kaufman Domains of Creativity Scale; SSCS = Short Scale of Creative Self.

Everyday Creative Behaviors

Did the anhedonia and control groups differ in their everyday creative behaviors? As Figure 1 illustrates, people in the anhedonia group had significantly higher scores on the BICB, $b = .49$ [.00, .98], $SE = .25$, $p = .049$, and on the CBI, $b = .62$ [.16, 1.08], $SE = .23$, $p = .008$, based on a regression model with the BICB and CBI as simultaneous outcomes. The effect sizes (.49 and .62) were in the “medium” range.

Creative Self-Beliefs

For the creative self-concept factors measured by the SSCS (see Figure 2), a regression model including efficacy and identity as simultaneous outcomes found that the anhedonia group was essentially the same as the control group in creative self-efficacy, $b = .05$ [-.43, .53], $SE = .24$, $p = .835$, and non-significantly higher, with a small-to-medium effect size, in creative personal identity, $b = .39$ [-.10, .89], $SE = .25$, $p = .116$.

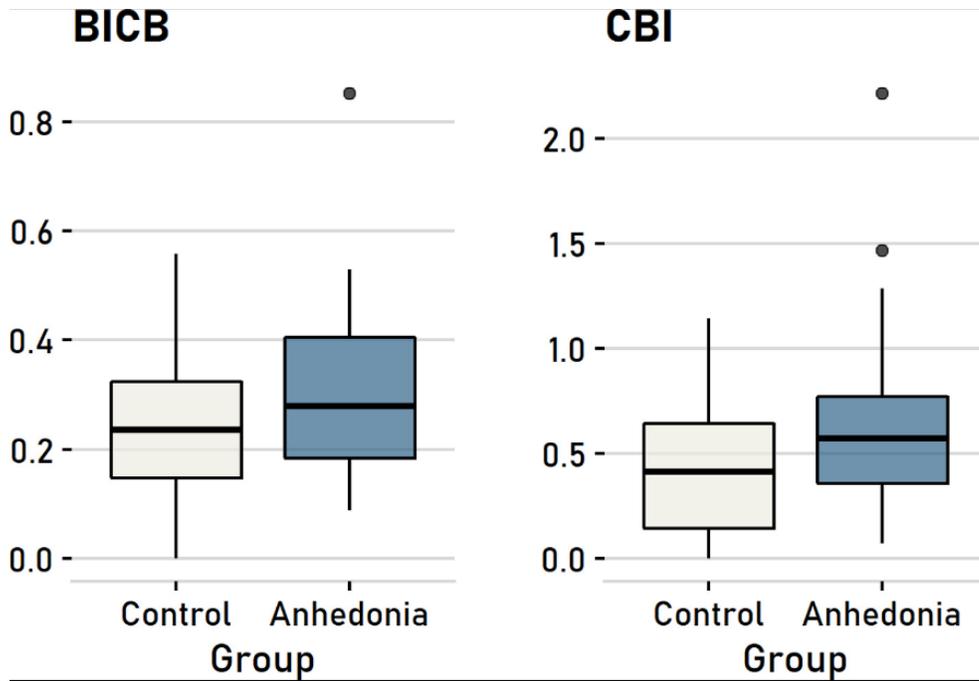


Figure 1. Everyday creative behavior scores (BICB & CBI scales) for the Control and Anhedonia groups. Note. The boxplot displays the median and interquartile range for each group.

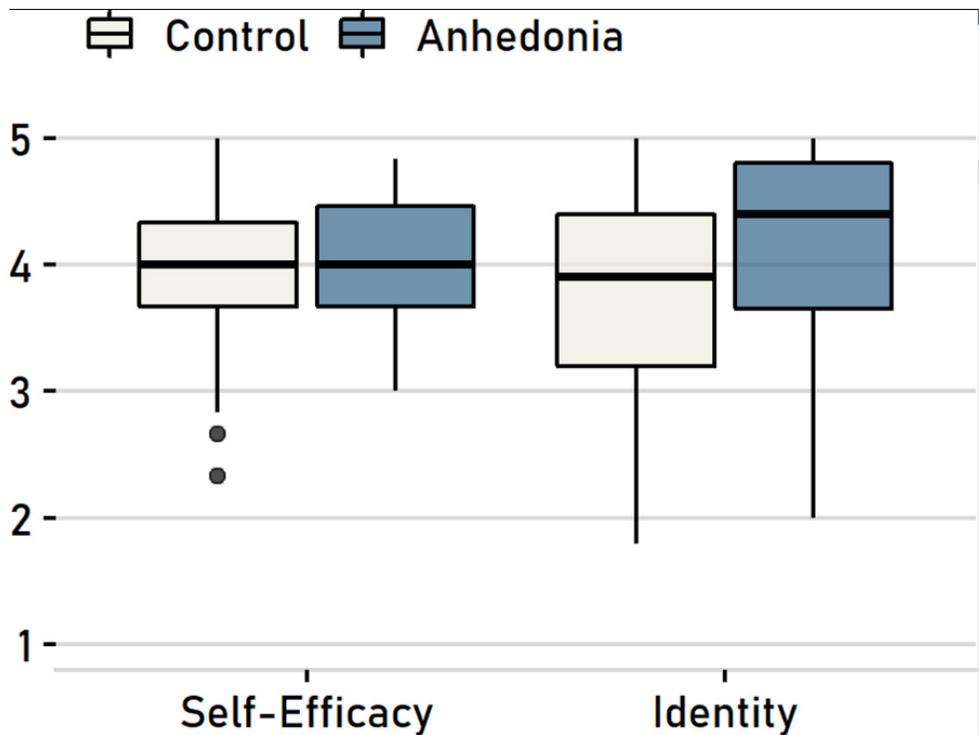


Figure 2. Creative self-efficacy and creative personal identity scores for the Control and Anhedonia groups. Note. The boxplot displays the median and interquartile range for each group.

For self-rated creativity in the 5 K-DOCS domains (see Figure 3), a regression model with all 5 domains as simultaneous outcomes found that the two conditions did not differ significantly in any domain: Artistic ($b = .12 [-.42, .66]$, $SE = .27$, $p = .663$), Mechanical/Scientific ($b = .11 [-.40, .63]$, $SE = .26$, $p = .665$), Performance ($b = .26 [-.24, .77]$, $SE = .26$, $p = .307$), Scholarly ($b = -.03 [-.43, .38]$, $SE = .21$, $p = .905$), and Self/Everyday ($b = -.28 [-.76, .21]$, $SE = .25$, $p = .264$).

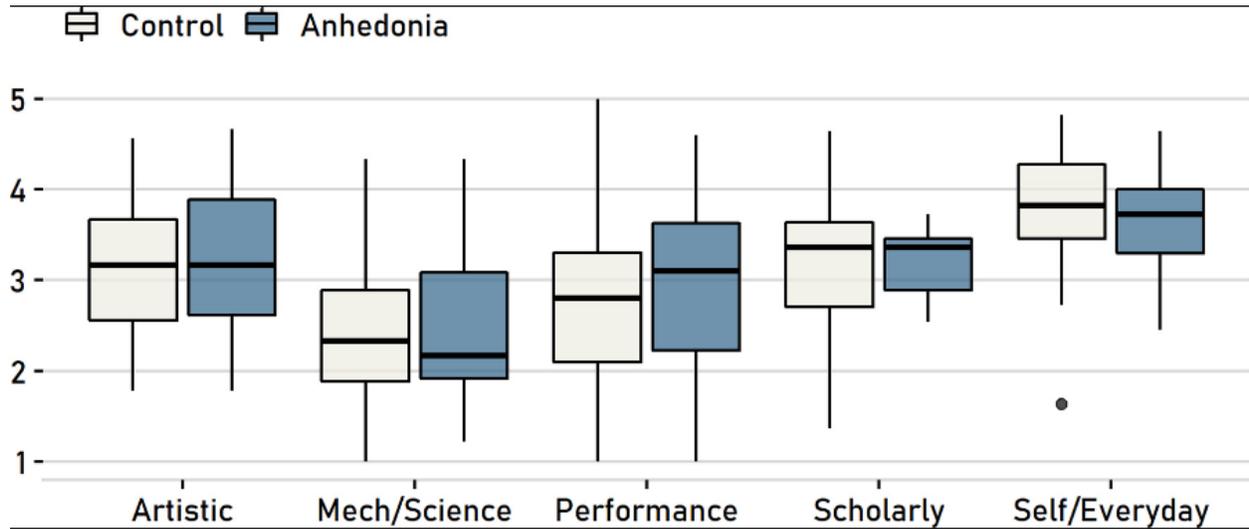


Figure 3. Self-rated creativity in the K-DOCS domains for the Control and Anhedonia groups. Note. The boxplot displays the median and interquartile range for each group.

Taken together, no effects were statistically significant for the SSCS and K-DOCS scales. Keeping in mind their non-significance, only 3 of the 7 effect sizes are worth noting: Compared to the control group, people in the anhedonia group had a higher creative personal identity (.39) and rated themselves are relatively higher (.26) in performance creativity (e.g., domains involving public performance) and relatively lower (-.28) in self/everyday creativity (e.g., finding solutions to common personal and interpersonal situations).

Creative Achievement

For CAQ scores, we analyzed the CAQ total score and Arts and Sciences subscales. The CAQ scores were log-transformed to reduce skew (Silvia et al., 2012). As Figure 4 illustrates, the anhedonia and control groups did not differ significantly based on a regression model with the CAQ Total ($b = .12 [-.41, .66]$, $SE = .27$, $p = .651$) as the outcome. A follow-up model with the Arts ($b = .08 [-.46, .61]$, $SE = .27$, $p = .779$) and Sciences ($b = .07 [-.46, .60]$, $SE = .27$, $p = .785$) subscales as joint outcomes found small, non-significant effects.

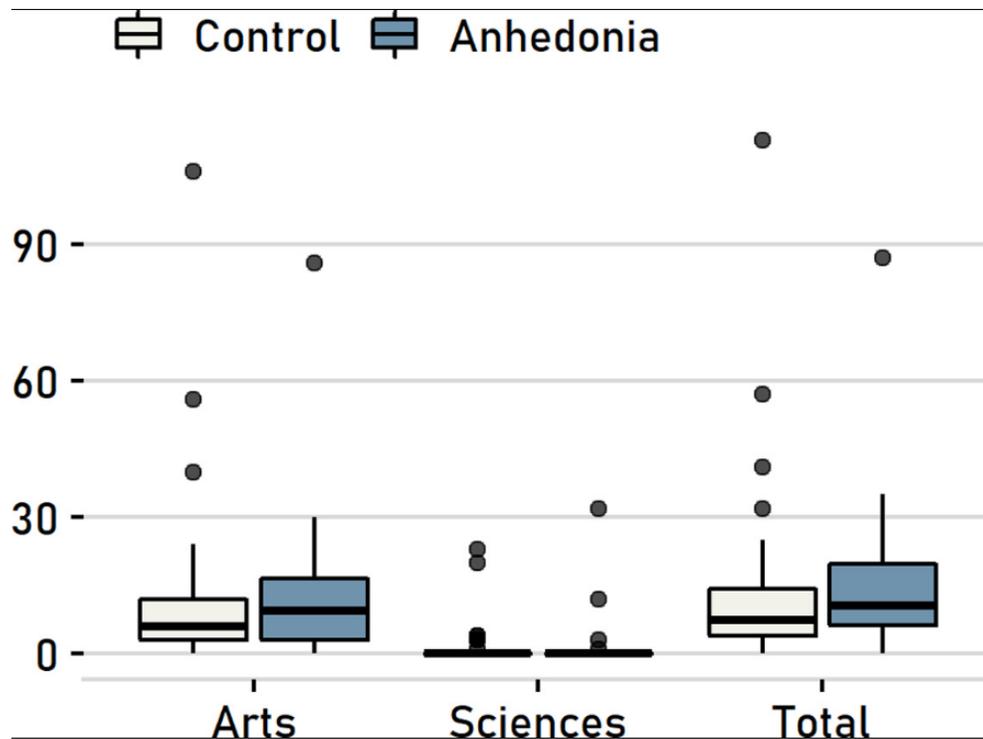


Figure 4. CAQ total scores and Arts and Sciences subscale scores for the Control and Anhedonia groups. Note. The boxplot displays the median and interquartile range for each group. Raw CAQ scores are presented.

Replicating Standard Findings

For creativity studies where small and null effects are anticipated, we have suggested that researchers replicate common effects to rule out the possibility that the assessments or sampling design simply failed (Silvia & Kimbrel, 2010). In the present sample, we evaluated correlations between self-reported creativity and Openness to Experience, a cornerstone construct in creativity research (Karwowski & Lebuda, 2016; Oleynick et al., 2017). Openness to Experience, measured with the full NEO-PI-3 (McCrae, Costa, & Martin, 2005), correlated significantly at the usual effect size levels with the BICB ($r = .29$), CBI ($r = .31$), KDOCS Artistic Creativity ($r = .48$), creative self-efficacy ($r = .40$) and identity ($r = .35$), and CAQ Total ($r = .44$), so the present sample and data appear credible for evaluating the effects of anhedonia on creativity.

Discussion

The present research builds upon past work in some useful ways. First, studies that select for mental health criteria are much less common than the other two sampling designs (Taylor, 2017). Second, positive affect, approach motivation, and self-regulation are prominent in the larger creativity literature (Baas et al., 2016; Ivcevic & Hoffmann, 2017; Karwowski & Beghetto, 2019), so it is worth exploring links between creativity and anhedonia.

The findings for clinically significant anhedonia do not necessarily resemble the findings for studies of positive affect and approach motivation in non-clinical samples, at least with regard to everyday creative behaviors and creative identities. Based on significance testing, people in the

depressive anhedonia condition had significantly higher scores on the BICB and CBI, two measures of engagement in everyday creative activities. Based on effect sizes, anhedonia had medium effect sizes reflecting higher everyday creativity (BICB and CBI), a small-to-medium effect size reflecting higher creative personal identity (SSCS), and small effect sizes reflecting higher self-rated performance creativity and lower self-rated self/everyday creativity (K-DOCS). No notable effects appeared for the CAQ, which focuses on major public accomplishments. We should emphasize that most of these smaller effects had confidence intervals including zero, so they should be seen as food-for-thought for future research and meta-analysis.

It bears repeating that the major research designs in this literature—studying covariance in broad samples, recruiting creative samples, or recruiting clinical samples—afford different claims that logically need not agree (Silvia & Kaufman, 2010; Taylor, 2017). The probability that someone identifies as male given that they wear bow ties almost surely differs from the probability that someone wears bow ties given that they identify as male, but this disparity is not a “replication failure” or a problem for how we understand dapper masculinity. Logically, both “anhedonic people are more likely to have creative hobbies” and “creative people are less likely to experience anhedonia” can be true.

Samples with severe, clinically important symptoms identified via structured clinical interviews have rarely been studied in creativity research. Although psychopathological constructs can be represented as dimensions (Krueger et al., 2018), relationships with other factors vary across the dimensions, creating complex discontinuities. For the purposes of understanding social relationships, by analogy, middle-aged adults are not simply “higher on the age dimension” than middle-schoolers. Few studies have recruited clinical samples of adults with major depression (see Taylor, 2017), let alone the specific feature of anhedonia, so more studies would be necessary for the field to understand if creative processes shift and transform as symptoms become increasingly severe.

We do not want to overinterpret causal aspects of these findings, but they seem consistent with the large body of work that emphasizes the value of creative activities as a means of coping and resilience (Drake, Hastedt, & James, 2016; Richards, 2018; Shafir, Orkibi, Baker, Gussak, & Kaimal, 2020). Likewise, sociocultural schools of thought emphasize factors that shape people’s self-selection into creative hobbies and occupations. As Kaufman and Baer (2002) noted in the context of poetry, many creative activities have low barriers to entry—they do not require recruiting large groups, buying expensive equipment, committing to years of formal schooling, or enduring standardized tests—and thus afford wider participation in the face of barriers and inequalities.

In any event, the complex issues surrounding creativity and mental health will be settled by the evolution of large literatures, not by any single study (Silvia & Kaufman, 2010), and we strongly encourage researchers to consider anhedonia in future work. As a transdiagnostic feature that appears in many disorders, anhedonia has the potential to bridge several mental health domains (e.g., depressive anhedonia and anhedonic qualities of schizotypy) and inform models of creativity that emphasize motivational and goal processes (Baas et al., 2016; Karwowski & Beghetto, 2019).

As caveats, we should highlight that the present sample, like most studies using face-to-face interviews, is relatively small. In the absence of national databases, recruiting based on mental health is much more time and resource-intensive than recruiting based on creative interests, occupations, or achievements. Scores for highly skewed outcomes, such as creative achievement, are particularly affected by sampling variance, so we have more confidence in the findings for everyday creative behaviors and creative self-concepts than for the volatile CAQ scores. In

addition, the sample was recruited with some unique constraints from the project's primary goals, such as being free from antidepressant medication and in good cardiovascular health (see OSM). It is hard to say what consequences these sampling criteria would have for findings about creativity, but having a relatively healthy sample likely reduced generalizability.

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