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PERFECTIONISTIC STANDARDS AND CREATIVE THINKING

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**Is Perfectionism a Killer of Creative Thinking? A Test of the Model of Excellencism
and Perfectionism**

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Abstract:

The standards that a person pursue in life can be set in a rigid or flexible way. The recent literature has emphasized a distinction between high and realistic standards of excellence, from high and unrealistic standards of perfection. In two studies, we investigated the role of striving toward excellence (i.e., excellencism) and striving toward perfection (i.e., perfectionism) in relation to divergent thinking, associative thinking, and openness to experience, general self-efficacy, and creative self-beliefs. In Study 1, 279 university students completed three divergent thinking items which called for creative uses of two common objects and original things which make noise. A measure of openness to experience was included. Results from multiple regression indicated that participants pursuing excellence tended to generate more answers and more original ones compared to those pursuing perfection. Openness to experience was positively associated to excellencism and negatively associated to perfectionism. In Study 2 ($n = 401$ university students), we replicated these findings and extended them to non-creative associative tasks requiring participants to generate chains of unrelated words. Additional individual differences measures included general self-efficacy, creative self-efficacy, and creative personal identity. The results suggested that excellencism was associated with better performance on divergent thinking and associative tasks, compared to perfectionism. Excellencism was positively associated with all four personality variables, whereas perfectionism was significantly and negatively associated with openness to experience only. Implications for the distinction between perfectionism and excellencism with respect to creative indicators are discussed. In addition, the paradoxical finding that perfection strivers had high creative self-efficacy and creative personal identity but lower openness to experience and poorer performance on objective indicators of creative abilities is discussed.

Keywords:

Perfectionism; Excellencism; Divergent Thinking; Associative thinking; Openness to experience; Self-Efficacy; Creativity

Is Perfectionism a Killer of Creative Thinking? A Test of the Model of Excellencism and Perfectionism

Many bloggers describe perfectionism as a “killer of creativity”. Despite this widespread claim, research on the relationship between perfectionism and creativity has been rare and yielded inconsistent findings. There are reasons to believe that perfectionism could either impede or facilitate creativity. On the one hand, the flexibility, openness to experience, and tolerance of mistakes needed to be creative are lacking from perfectionists (e.g., Somov, 2010). On the other hand, producing novel and useful creative work is neither easy nor effortless. Creative achievement requires commitment and perseverance (e.g., Amabile, 2001) which are well characterized in perfectionists. Creative people are often hard-working individuals and their aiming and striving toward high standards is considered a key factor in their creative success (Simonton, 2014).

In the current research, we proposed that a differentiation between the pursuit of perfectionistic standards and the pursuit of excellence is needed to clarify whether perfectionism is harmful or beneficial to the creative process. Based on a recently developed theory – the *Model of Excellencism and Perfectionism* (MEP; Gaudreau, 2019) – our primary goal was to clarify whether excellencism is sufficient or if perfectionistic standards offers incremental benefits in the production of creative ideas. We assessed an *academic* perfectionism and excellencism in Study 1 and a *dispositional trait* of perfectionism and excellencism in Study 2. This stand in contrast to a measurement of perfectionism and excellencism tailored to a creative pursuit (e.g., perfectionism in arts). Our choice was motivated by our interest for academic and dispositional variables (e.g., academic perfectionism) in relation to creative indicators relevant to academia (e.g.,

intellectual or semantic creativity). Across two studies, relying on different but complementary methods, we investigated whether academic and dispositional perfectionism were a “killer of creative abilities”.

The Model of Excellencism and Perfectionism

Perfectionism is generally defined as “a personality disposition characterized by striving for flawlessness and setting exceedingly high standards of performance accompanied by overly critical evaluations of one’s behavior” (Stoeber et al., 2015, p. 171; see also Frost et al., 1990; Hewitt & Flett, 1991). This definition, which is largely accepted by researchers, entails that perfectionism is a multidimensional construct with two broad dimensions: *perfectionistic standards* (also called personal standards perfectionism or perfectionistic strivings) and *perfectionistic concerns* (also called evaluative concerns or self-critical perfectionism). The former dimension, perfectionistic standards, captures the aiming and striving toward extremely high and strict standards—the relentless pursuit of flawlessness. The latter dimension, perfectionistic concerns, captures the tendency to evaluate oneself according to those standards (i.e., self-worth contingencies), responsible for the many doubts, worries over mistakes, and perceived social pressure attached to perfectionism.

Perfectionistic standards and perfectionistic concerns are differentially related to numerous personality, behavioral and emotional factors (Hill & Curran, 2016; Smith et al., 2016, 2018). First, effects of perfectionistic standards are usually mixed and ambiguous. For example, this dimension has a medium-size positive effect with academic achievement (Madigan, 2019) but also much weaker yet clinically meaningful positive effects with psychopathologies (Limburg et al., 2017), bulimic symptoms (Kehayes et al.,

2019) , and suicidal ideations (Smith, Sherry, et al., 2018). This pattern of findings explains why the perfectionistic standards dimension has often been described as a double-edge sword (Stoeber, 2014). Mixed findings might be in part attributable to a loose definition of perfectionistic standards; one that conflates the pursuit of perfection with the pursuit of excellence (Gaudreau, 2019; Osenk et al., 2020). Second, the effects of perfectionistic concerns are clearer, indicating an unhealthy pattern of associations. Meta-analytic results indicated that perfectionistic concerns have significant medium-size positive associations with employees' workaholism, burnout, stress, anxiety, depression, and reduced engagement (Harari et al., 2018).

Measures of perfectionistic standards have not clearly differentiated *high standards* from *perfectionistic* standards (e.g., Blasberg et al., 2016). This premise has inspired the development of the *Model of Excellencism and Perfectionism* (MEP) in which Gaudreau (2019) formalized the difference between the pursuit of excellence (i.e., excellence standards) and the pursuit of perfection (i.e., perfectionistic standards). Gaudreau argued that excellencism and perfectionistic standards are related but different constructs. Although both characterize individuals with high need for achievement, their goal setting and goal striving sharply differ. Excellence can be attained without reaching perfection. In contrast, perfection inexorably goes beyond excellence. Said otherwise, in excellencism, reaching excellence is largely satisfying, whereas in perfectionism, satisfaction comes only after perfection has been reached over and above the attainment of excellence. Words such as very good, competent, accomplished, successful, great, and capable are prototypical expressions closely tied to the pursuit of excellence. Based on these assertions, the MEP defines excellencism as a “tendency to aim and strive toward

very high yet attainable standards in an effortful, engaged, and determined yet flexible manner” (Gaudreau, 2019, p. 200). An example item measuring excellencism would be “my goal is to produce high quality work”. Perfectionism is more grueling and involves a form of aiming and striving that goes beyond excellence. Many words such as disproportionate, extreme, needless, too much, unreasonable, flawlessness, faultlessness, and exactness are part of the additional and exaggerated characteristics that separate perfectionism from excellencism. Therefore, the MEP defines perfectionism as a “tendency to aim and strive toward idealized, flawless, and excessively high standards in a relentless manner” (Gaudreau, 2019, p. 200). An example item measuring perfectionism would be “my goal is to produce error-free work”. Excellencism and perfectionistic standards are defined as distinct but correlated constructs because those who pursue excellence only pursue excellence whereas those who pursue perfection have to pursue excellence in their quest toward perfection. Furthermore, only perfection strivers are expected to experience the many doubts about their actions and evaluative concerns that generally accompany the pursuit of perfectionistic standards. As such, the MEP reiterates that perfectionism is a multidimensional construct as perfection strivers should often experience the many cognitive (e.g., doubts, concerns), socio-cognitive (e.g., perceived pressure), and socio-behavioral expressions (e.g., showing perfection to others) that are often accompanying the pursuit of perfection (Gaudreau, 2021).

The distinction between the pursuit of excellence and the pursuit of perfection has been discussed many times (e.g., Greenspon, 2000; Missildine, 1963) but never integrated in a model of perfectionism. Consequently, the effects of excellencism have potentially contaminated the effect sizes toward healthy outcomes known to be associated

with perfectionism (Osenk et al., 2020). This situation has recently been found to occur with academic achievement (see BLINDED), where the commonly found positive association between perfectionistic standards and academic achievement disappeared once excellencism was statistically accounted for. Overall, the MEP proposes that excellencism is a more precise point of reference to evaluate the effects associated with perfectionism. If perfectionism standards are beneficial, they should relate to positive outcomes over and above the effect of excellencism. Only in this case we can assert that perfectionism is a healthy pursuit.

Perfectionism and Creativity

Studies on the associations between perfectionism and creativity are scant considering the extensive literature dedicated to perfectionism and creativity separately (e.g., Fletcher & Speirs Neumeister, 2017; Starley, 2019). Reviewing the literature on perfectionism and subjective or objective measurement of creativity reveals that perfectionistic standards is often positively associated with creative indicators, whereas perfectionistic concerns is mostly uncorrelated with creative indicators.

We searched in the literature for studies examining the relation between perfectionism and creativity and listed 15 studies in 12 articles that we report in Table 1. This is not a systematic literature review but we searched databases (e.g., PsycInfo, Googles) using the truncated keywords *creativity and *perfectionism between 1990 and 2020, and we also perused the reference sections of retrieved articles to complement our review. We kept the articles published in English that reported a bivariate correlation between perfectionism and subjective or objective criteria of creativity. Rather than writing a narrative review (the most frequent approach in an empirical article), we closely

examined the correlations in order to detect trends across studies. These studies reported a total of 35 correlations, across 12 samples, between indicators of *perfectionistic concerns* and creativity. Of this number, 21 correlations (60%) were in the range of $-.10$ to $+.10$. Among the remaining 14 correlations, an equal amount of positive (above $.10$) and negative (below $-.10$) correlations were observed. Overall, the relationship between perfectionistic concerns is also largely heterogeneous and more often null.¹

Reviewing a total of 21 correlations, across 12 samples, between indicators of *perfectionistic standards* and creativity revealed that eight correlations (36%) were negligible (i.e., in the range of $-.10$ and $+.10$). Among the remaining 13 correlations, negative effects (below $-.10$) were found in three cases (14%) whereas positive effects (beyond $.10$) were found in 10 cases (48%). Note that some studies had multiple measures of creativity and therefore contributed more than once to these summary estimates. Overall, the relationship between perfectionistic standards can more aptly be considered heterogeneous across samples rather than positive, even if it is more frequently positive than negative.²

¹ When we average the correlations per sample, we find five samples with a negligible mean correlation (between $-.10$ and $+.10$), five with a negative mean correlation, and two with a positive mean correlation. The meta-analytical estimates were heterogeneous. Fixed effect: $r = -.010$, 95% CI = $[-.044, .023]$, heterogeneity $Q(11) = 54.499$, $p < .001$, I square = 79.816. Random effect: $r = -.037$, 95% CI = $[-.122, .048]$.

² When we average the correlations per sample, we find three samples with a negligible mean correlation (between $-.10$ and $+.10$), three with a negative mean correlation, and six with a positive mean correlation. The meta-analytical estimates showed a null correlation. Fixed: $r = -.009$, 95% CI = $[-.040, .023]$, heterogeneity $Q(11) = 77.925$, $p < .001$, I square = 79.816. Random effect: $r = -.047$, 95% CI = $[-.130, .036]$. After removing the four samples that focused on attitudinal flexibility, the correlation turned positive. Fixed: $r = .156$, 95% CI = $[.122, .191]$, heterogeneity $Q(7) = 39.199$, $p < .001$, I square = 82.142. Random effect: $r = .181$, 95% CI = $[.088, .271]$.

The Current Studies

Past studies yielded inconsistent findings regarding the association between perfectionism and creativity. In the current research, we addressed this point by differentiating perfectionism from excellencism. We conducted the first two empirical studies to investigate whether perfectionistic standards has a beneficial, insignificant, or harmful association with creative abilities over and above excellencism. Both studies relied on tests of divergent thinking to capture participant's potential in generating creative ideas. Tests of divergent thinking are far from being perfect indicators of creative potential. Notably, the low inter-correlations between various tests of divergent thinking (Runco et al., 2016) and the various coding procedures that exist (Reiter-Palmon et al., 2019) have contributed to a skepticism regarding those tests. Despite evidence for their predictive and discriminant validity (Cramond et al., 2016; Runco & Acar, 2012; Zeng et al., 2011), and improvement regarding the coding methods (Reiter-Palmon et al., 2019), the ecological and conceptual validity of those tests are still disputed on the basis that they seldom assess the appropriateness of ideas generated, a necessary criterion for creative ideas. Moreover, these tasks usually mitigate the influence of expertise, motivation, and other components of the creative process on the scores (Zeng et al., 2011). Researchers have stressed the fact that divergent thinking tests are estimates of a creative thinking *potential*, and are not synonymous with creative thinking per se. Under this premise, divergent thinking tests are considered valid estimate of creative thinking potential (Runco & Acar, 2012).

Study 2 took a complementary approach and included two non-creative tasks of associative abilities requiring the generation of words unrelated to each other. Moreover,

Study 2 included self-reported indicators of creativity to further test the role of excellencism and perfectionism on creative potential (Guilford, 1967). Self-reported indicators of creativity can inform researchers about a participant's creative potential due to the influence of self-beliefs on subsequent motivation, interest, and effort investment (Karwowski & Barbot, 2016).

Study 1

In Study 1, we measured academic perfectionism and excellencism. The data presented here is part of a larger study that examined the associations between academic motivation and divergent thinking (BLINDED). Perfectionism has previously been studied at both the domain-specific and dispositional levels of analysis and the results have typically been highly similar across those two levels (e.g., Franche & Gaudreau, 2016; Madigan, 2019). In Study 1, we explored the performance of excellence and perfection strivers on three divergent thinking tasks. The tasks required participants to generate creative uses for a brick, a journal, and to name things that make noise (Wallach & Kogan, 1965). The personality trait openness to experience was included as a potential way to discriminate between excellence and perfection strivers. Openness to experience is a robust predictor of various creativity indicators, including divergent thinking (e.g., Carson et al., 2005; da Costa et al., 2015; Feist, 1998). Open individuals are characterized by their intellectual and sensorial curiosity, non-conformity, and sensitivity. We expected excellence strivers to perform better on divergent thinking tasks than perfection strivers and concurrently to manifest higher openness toward experience.

Method

Participants

We used Bosco et al. (2015) correlational effect size benchmark of .160 (50th percentile of the distribution of 147,328 correlations published between 1980 and 2010 in two leading applied psychology journals) with the G*Power software to estimate the required sample size given statistical power ($1-\beta > .80$), two-tailed significance test ($\alpha < .05$), and effect size ($r = .160$; $f^2 = .026$) in a multiple regression with two predictors. In light of this estimation, we aimed to recruit 300 participants.

The final sample was composed of 279 (72.7% female) undergraduate students from a Canadian university in the province of Ontario. From the initial 297 participants, 17 were excluded due to large amount of missing data (>40%) and another was removed because this participant provided the same answer to multiple questions in a row. No multivariate outlier was detected after Mahalanobis inspection ($p > .001$, $df = 5$). Participants' age ranged from 17 to 54 years old ($M = 20.0$; $SD = 4.5$). They identified as White (56.6%), Asian (12.2%), Arabic (7.2%), Black (11.1%), Aboriginal (1.4%), Hispanic (2.2%), or other or mixed ethnicity (9%). Academic faculties represented included social sciences (45.3%), natural sciences (21.9%), health sciences (20.9%), arts (5%), management (4%), engineering (1.4%), and other (0.4%). They received one point toward their introductory psychology course.

Procedures and Measures

Participants answered socio-demographic questions and completed online questionnaires and tasks which assessed their personality, degree of academic perfectionism and excellencism, and divergent thinking abilities. Four additional

questionnaires (academic motivation, stress management, a scale of creative domains, and electronic devices use), unrelated to the purpose of the current study, were also part of the questionnaire completed by participants. The whole procedure took about 40 minutes to complete.

Excellencism and Perfectionism. The constructs of excellencism and perfectionism – as defined in the MEP (Gaudreau, 2019) – were assessed using the SCOPE scale (22 items, Gaudreau & Schellenberg, 2018). Excellencism refers to the pursuit of excellence, whereas perfectionism refers to the pursuit of perfectionistic standards. In this study, participants referred to their goals as university students. Items were preceded with the stem “My goal at school is...”. Examples items for excellencism are “...to perform very well” and “...to be very productive”. Examples items for perfectionism are “...to perform perfectly” and “...to be exceptionally productive all the time”. Participants rated their answer on a scale ranging from 1 (*not at all*) to 7 (*totally*). Average scores of excellencism and perfectionism were computed from their respective eleven items. The two-factor structure of the SCOPE, as well as its convergent and divergent validity, and internal reliability were demonstrated in a recent validation study across seven samples (BLINDED). Internal consistency of the scores of excellencism ($\alpha = .98$) and perfectionism ($\alpha = .98$) was high in our sample. The internal consistency of a shorter version of this scale having half the number of items (10 items in total) has been reported to be $\alpha = .84$ for excellencism and $\alpha = .94$ for perfectionism in a study by Cheek and Goebel (2020), thus suggesting good reliability of the constructs even with fewer items.

Divergent Thinking (DT). Participants were instructed to come up with as many creative answers as they could to the following three items: 1) “Tell us all the different ways you could use a newspaper”, 2) “Tell us all the different ways you could use a brick”, and 3) “Name all the things you can think of that make noise” (Wallach & Kogan, 1965). Participants were allotted five minutes per item. The originality of answers was evaluated by two judges based on the subjective scoring guidelines of Silvia and colleagues (2008). Answers were ranked in alphabetic order prior to being judged by two graduate students. The judges were asked to give a score from 1 (*not creative at all*) to 5 (*highly creative*) to the best two answers (according to the judges) of each participant. The two scores were then averaged into a single score and further averaged across both judges which provided a global score of *originality*. Answers that were uncommon, remote or clever were given a higher score of originality. A global score of *fluency* was also computed by counting the number of answers provided (quantitatively) and averaging these counts across the three items. The inter-rater reliability (intraclass coefficients) for the originality scores ranged from .80 to .83. The correlations between DT items ranged from .42 to .54 for the originality scores ($\alpha = .73$) and from .59 to .73 for the fluency scores ($\alpha = .72$).

Openness to Experience. Openness to experience was assessed using the IPIP-NEO inventory (24 items; Goldberg, 1999). This questionnaire measures openness to experience from six sub-domains: *imagination, artistic interests, emotionality, adventurousness, intellect, and liberalism*. The factorial structure of this scale has been found to be acceptable through principal components analyses (Johnson, 2014). Relevant to the current study, only one sub-domain, namely emotionality, did not load primarily on

its expected component in this validation study, but rather on neuroticism. We computed a global score by averaging all the items. An example item for the artistic-interest sub-domain is “I believe in the importance of art”. An example item for the intellect sub-domain is “I love to read challenging materials”. Participants responded on a scale from 1 (*very inaccurate*) to 5 (*very accurate*). Internal reliability for this scale was acceptable ($\alpha = .77$) and similar to the findings of Johnson (2014; $\alpha = .83$).

Plan of Analyses

In the preliminary analyses, we examined the descriptive statistics and simple correlations. The main analyses report a multivariate multiple regression model whereby the continuous score (from 1 to 7) of perfectionism and excellencism simultaneously predict the three dependant variables originality, fluency, and openness to experience (for a total of 20 parameters). Analyses were performed in Mplus 7 with Full Information Maximum Likelihood (FIML) estimator. The model, allowing for covariances between the three dependent variables, is fully saturated (all links estimated as in a traditional regression-like model) and rely on manifest variables. The two predictors were centered to facilitate calculation of predicted values for three subtypes of strivers.

For each dependent variable, we used the coefficients from the regression (i.e., intercept and unstandardized beta) to calculate the predicted values for subtypes of strivers with the methodological guidelines of the MEP (Gaudreau, 2012, 2019). As defined and operationalized in the MEP, the subtypes represent individuals characterized by their high or low levels of excellencism and perfectionism, namely *perfection strivers* (+1 *SD* above the mean on both perfectionism and excellencism), *excellence strivers* (–1 *SD* below the mean of perfectionism and +1 *SD* above the mean of excellencism), and

non-perfection/non-excellence strivers (-1 *SD* below the mean of perfectionism and excellencism). This approach, which has been frequently used in the perfectionism literature (Hill & Madigan, 2017), is advantageous because predicted values are obtained and compared within the confines of the multiple regression, rather than by artificially dividing participants in subgroups (as in a median-split approach). This maintains statistical power while avoiding artificial dichotomization of the predictors in ways that often create spurious effects that fail to replicate across samples (e.g., Bissonnette et al., 1990; Streiner, 2002). We computed 95% difference-adjusted confidence intervals from the standard errors of the regression coefficients (Cousineau, 2017; Cumming & Finch, 2005; Goldstein & Healy, 1995). Moreover, a standardized difference effect size was obtained from the subtraction of two predicted values divided by the standard deviation of the dependent variable (e.g., $d = [\text{pred. value perfection strivers} - \text{pred. value excellence strivers}] / SD$ of the dependent variable; Gaudreau, 2012). We computed 95% confidence intervals for the Cohen's d effect sizes via bias-corrected bootstrap procedures with 10,000 resampling (Efron & Tibshirani, 1993).

Results

Preliminary Analyses

The percentage of missing values ranged from 0% to 1.8% (for the originality score). The missing values on originality were participants who either provided no answer or non-serious answers according to the judges. Missing values were missing completely at random (Little's MCAR test: $\chi^2(11) = 5.74, p = .89$). FIML estimator handled missing values in Mplus using all available information to estimate the model.

The descriptive statistics and correlation coefficients for the main variables are reported in Table 2. We see that fluency is strongly non-normally distributed with large skewness. This is expected as this measure has no upper limit. Excellencism and perfectionism were substantially correlated with one another ($r = .51, p < .001$), which is consistent with the idea that they are empirically related but conceptually distinct pursuits. Similarly, the scores of originality and fluency from the divergent thinking tasks were correlated ($r = .62, p < .001$). This is also expected because original answers tend to come later in the sequence of answers (Forthmann et al., 2020; Osborn, 1963).

Main Analyses

The results of the multivariate multiple regression with excellencism and perfectionism predicting originality, fluency, and openness to experience revealed a consistent picture. Excellencism was a significant positive predictor, whereas perfectionism was a significant negative predictor of all three dependent variables. More specifically, excellencism significantly predicted higher originality (standardized regression coefficients $\beta = .15, p = .026$), fluency ($\beta = .17, p = .008$), and openness to experience ($\beta = .17, p = .013$). Perfectionism significantly predicted lower originality ($\beta = -.22, p = .001$), fluency ($\beta = -.25, p < .001$), and openness to experience ($\beta = -.22, p = .002$).

Excellencism and perfectionism together explained 3.6% ($F(2, 279) = 5.02, p = .007$), 4.8% ($F(2, 279) = 6.94, p = .001$), and 4.1% ($F(2, 279) = 5.73, p = .004$) of the variance in originality, fluency, and openness to experience, respectively. More crucially, the contributions of excellencism and perfectionism were always of opposite signs, with

excellencism being positively associated with indicators of creativity and perfectionism negatively associated with them.

Predicted Values for Subtypes of Strivers

Combinations of high and low levels of excellencism and perfectionism were investigated via predicted values for three subtypes of strivers obtained from regression coefficients.³ The results are shown in Figure 1.

As seen in Figure 1, excellence strivers (i.e., individuals high on excellencism but low on perfectionism) were significantly higher on originality, fluency, and openness to experience, with standardized differences relative to perfection strivers reaching respectively $d = 0.43$ [0.15, 0.71], $p = .002$, $d = 0.50$ [0.20, 0.79], $p = .001$, and $d = 0.44$ [0.16, 0.73], $p = .002$ (here and below, square brackets denote 95% confidence intervals). Additionally, the difference between excellence strivers and non-strivers were respectively: $d = 0.30$ [0.03, 0.57], $p = .028$, $d = 0.34$ [0.08, 0.60], $p = .009$, and $d = 0.34$ [0.07, 0.62], $p = .014$, for originality, fluency, and openness to experience. Lastly, the differences between perfection strivers and non-strivers were all negative but not significantly different from a null difference: originality ($d = -0.13$ [-0.41, 0.15], $p = .35$), fluency ($d = -0.15$ [-0.45, 0.14], $p = .30$), and openness to experience ($d = -0.10$ [-0.35, 0.15], $p = .44$).

³ Strivers are not directly observable groups or categories of people. As noted in the method, intercept and beta coefficients of the regression are used to calculate predicted values of each subtype of strivers. Knowing the mean and standard deviation of perfectionism and excellencism, the average levels of perfectionism and excellencism for each type of strivers can be easily computed. For example, the subtype of *perfection strivers* represents individuals who strongly to very strongly agreed to the items of the perfectionism subscale (sample 1: $4.18 + 1.82 = 6.00$ out of 7, sample 2: $3.87 + 1.61 = 5.48$ out of 7). Strong to very strong endorsement of these items is a needed and sufficient conditions for these individuals to be defined and interpreted as perfection strivers.

Brief Discussion

The results of Study 1 provided the first evidence for the hypothesis that excellencism and perfectionism are distinctively associated with divergent thinking abilities. Effect size were moderate and comparable to the average correlations observed in the personality literature (e.g., Bosco et al., 2015). Excellence strivers — compared to perfection strivers — performed 0.43 and 0.50 standard deviations better on the originality and fluency scores of DT tasks. Excellence strivers also outperformed non-strivers by 0.30 and 0.34 standard deviation on those variables. By contrast, perfection strivers had comparable predicted values than non-strivers. Similar findings were found for openness to experience.

These results suggest that strivings toward high goals can be conducive of creative thinking if pursued in a flexible manner. Aiming for perfection and evaluating oneself accordingly might be triggering unnecessary tensions within individuals which is inhibiting creativity. This might be avoided by aiming for excellence.

Study 2

The aim of Study 2 was to replicate the findings of Study 1 and extend them in three different ways. First, considering that perfectionism can be studied at the domain-specific and dispositional level (e.g., Franche & Gaudreau, 2016), one goal of Study 2 was to replicate what we observed with academic perfectionism and excellencism at the dispositional level with a measure of everyday perfectionism.

Second, based on the results of Study 1, we were interested in the concept of *associative abilities* (Beaty et al., 2014; Benedek et al., 2012). Associative abilities are processes behind the fluent generation of ideas, be them creative or not. Word-

associations tasks are often used to assess associative abilities (e.g., Benedek et al., 2012; Benedek & Fink, 2019). In Study 2, we included two associative tasks requiring the generation of unrelated words or words related only to the previous word (Benedek et al., 2012). These tasks are “non-creative” because original answers are weighted the same as unoriginal ones. High scores on associative tasks represent the capacity to produce a stream of related or unrelated ideas, concepts, or thoughts in an uninterrupted manner. Associative abilities assessed through semantic material in particular have been linked to flexible semantic memory structures as well as efficient search mechanisms within semantic spaces (Hass, 2017; He et al., 2020). Based on the result of Study 1, we expected perfectionism to be associated with poorer associative abilities and excellencism to be associated with better associative abilities.

Third, we wanted to extend the findings of Study 1 by furthering our exploration of the nomological network of creativity. In addition to replicate our findings with openness to experience, we also examined general self-efficacy, creative self-efficacy, and creative personal identity. The former corresponds to a belief that one has the capacity to mobilize the motivation, cognitive resources, and courses of action needed to meet the demands of a wide variety of achievement situations (Wood & Bandura, 1989). Because general self-efficacy encompasses all achievement situations, it also includes situations where creativity is required. By comparison, *creative self-efficacy* focuses exclusively on situations which call for creative thoughts (Tierney & Farmer, 2002). Robust predictors of self-efficacy judgements comprise past successes and failures, and the feedback that accompanies them (Tierney & Farmer, 2002). For this reason, the additional discrepancy set by standards of perfection —compared to standards of

excellence— may have negative impacts on self-efficacy judgments. This would stem from repeated failures to meet one's standards. Despite this, perfection strivers could still be associated with high general self-efficacy, because perfectionistic standards are expected to relate to rigid and relentless effort and perseverance (Ljubin-Golub et al., 2018; Stoeber et al., 2010). In other words, perfection strivers could probably not maintain their extreme and idealized standards if their self-efficacy was low (see also Osenk et al., 2020). As such, overestimating their likelihood of success may be needed to protect their sense of self against recurrent anxiety associated with their fear of failure. Therefore, we expected both excellence and perfection strivers to be associated with high levels of general self-efficacy.

In Study 2, based on the results of Study 1 with openness to experience, we proposed that although perfection strivers may feel confident in their capacity to meet the demands of various difficult tasks (including creative tasks), they may not consider creativity as an aspect important to themselves. To examine self-beliefs specific to creativity, we assessed creative self-efficacy and creative personal identity. The latter corresponds to beliefs that creativity is an important aspect of oneself (Karwowski, 2012). However, we note that the substantial correlation between the two constructs in a validation study ($r = .82$; Karwowski, 2012) could suggest a unique factor corresponding to a creative self-concept (see also Judge et al., 2002). Nonetheless, we hypothesised that perfection strivers would have high levels of general and creative self-efficacy, but lower levels of creative personal identity compared to excellence strivers. Creative tasks are demanding and less structured and the criteria of success are often ambiguous and unclearly defined. Given that perfection strivers prefer certainty and tasks with higher

likelihood of success (i.e., fear of failure), we hypothesized that they are less likely to identify with creative domains. Note that this hypothesis could be different in contexts in which creativity would be a more defining characteristic of the population (e.g., performance artists). We recruited a sample of students in social, natural and health sciences programs rather than students in programs in which creativity is more salient (e.g., music, arts, dance). Perhaps perfection strivers in artistic domains would be more likely to identify with the concept of creativity. However, our hypothesis is based on the idea that the average perfection strivers in the general population are less likely to identify with the concept of creativity.

Method

Participants

We aimed to recruit a larger sample than Study 1 because associative tasks have yet to be used in the perfectionism literature and the expected effect size was unknown. A sample of 401 (72.4% female) undergraduate students from a public Canadian university in the province of Ontario was retained for analyses. From the initial 470 participants, 64 were excluded due to large amount of missing data (>60%), four were identified as duplicates and were excluded, one univariate outlier ($-5 SD$ on the excellencism scale) was also removed. This participant gave the same answer to multiple questions in a row. No multivariate outlier was identified after Mahalanobis inspection ($p > .001$, $df = 10$). Participants' age ranged from 16 to 42 years old ($Mean = 19.3$, $SD = 3.2$) and described themselves as White (53.1%), Asian (16.5%), Arabic (12.7%), Black (8.2%), Aboriginal (0.7%), Hispanic (1.5%), or other/mixed ethnicity (7%). Academic faculties included social sciences (45.1%), natural sciences (26%), health sciences (17.5%), arts (4.8%),

management (1%), engineering (1%), and other (4.6%). Participants received one point towards their introductory psychology course.

Procedures and Measures

Participants completed online questionnaires and tasks which assessed their degree of dispositional perfectionism and excellencism, their divergent and associative abilities, openness to experience, general self-efficacy, creative self-efficacy, and creative personal identity. Additional questionnaires (aberrant salience, need for structure, need for cognition, and mental boundaries) were part of the study for exploratory purposes and were excluded from the analyses. The whole procedure took about 45 minutes to complete.

Excellencism and Perfectionism. The SCOPE can be used at the domain-specific (as per Study 1) or the dispositional levels using the same pool of items (i.e., 22 items) with different instructions (Gaudreau & Schellenberg, 2018). In Study 2, we used the dispositional version. Items were preceded with the stem “As a person, my general goal in life is to...”. Examples of items measuring excellencism and perfectionism are “... attain difficult but realistic goals” and “... attain perfection”, respectively. Average scores were computed for excellencism and perfectionism. Internal consistency for excellencism ($\alpha = .94$) and perfectionism ($\alpha = .97$) were high and comparable to those obtained in Study 1.

Divergent Thinking (DT). Participants were instructed to come up with as many creative answers as they could using the same three items as Study 1. They were allotted three minutes per questions (instead of five). This reduction of the time to complete the tasks allowed us to include the additional measurements of associative abilities without

increasing the length of the study while also avoiding cognitive fatigue. The originality and fluency scores were obtained in the same way as Study 1. Answers were judged by a trained graduate student and a trained undergraduate student. Inter-rater agreement (Intra Class Coefficients, ICC) for the originality scores ranged from .82 to .86. Inter-items correlations ranged from $r = .31$ to $.42$ ($\alpha = .63$) for the originality scores and from $r = .54$ to $.70$ ($\alpha = .78$) for the fluency scores. Unfortunately, due to a programming error, participants could not enter more than 29 answers and thus, the maximum score of fluency was set to 29. This ceiling has been reached by five participants for item 1, two participants for item 2, and 44 participants for item 3 (i.e., things which make noise).

Openness to Experience. The openness to experience factor was assessed via the Big Five Aspect scale (20 items; DeYoung et al., 2007). The choice of a different scale than Study 1 was motivated by a desire to conceptually replicate the findings with openness to experience. This scale divides the factor Openness to experience into two facets named “Openness” and “Intellect”. An example item for the intellect facet is “I am quick to understand things”. An example item of the openness facet is “I believe in the importance of art”. Participants answered on a 5-points scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*). The factor structure of the scale, involving two facets, has been supported in the study of DeYoung et al. (2007). They further demonstrated that social desirability did not account for the scores on the scale. We computed a composite variable by averaging all the items ($\alpha = .78$; which was similar to the findings of DeYoung et al. (2007) who reported an average $\alpha = .82$ across their samples).

Associative Abilities. Two associative tasks were employed in which participants were required to generate chains of unrelated words. The tasks were taken from Benedek et al. (2012).

Association task. This association task required participants to generate a chain of words starting with a given word, whereby each response must relate only to its previous response (e.g., starting with the word "summer", a possible chain could be: "beach, sand, castle, knight, horse, race, ..."; Benedek et al., 2012). Thus, the task becomes more and more difficult as more answers are generated. Participants completed two trials of one minute each. The starting concepts were: "Sickness" and "Man." To validate that participants correctly performed the task, each answer was evaluated by two independent judges. The judges validated the answers according to the following rules: 1) an answer is marked as incorrect whenever it is related to a preceding one whereas it should not be. However, only the answer that came later in the sequence was marked as incorrect. 2) Incorrect answers were colored in red and the judges continued their marking while pretending the incorrect answer never existed in the list (hence, later words were not penalized if they related to the incorrect word). 3) Judgments of relationships should not be too strict. Among the answers not supposed to be associated, those that were "weakly" related were permitted, whereas those "moderately" or "strongly" related were marked as incorrect. The total number of words generated minus the total number of incorrect answers on a given trial yielded a score of *association* for that trial. Inter-rater agreement was ICC = .95 and .92 for item 1 and 2 respectively.

Dissociation task. This task is similar to the association task described above, but this time all responses must be unrelated to all other responses, including the presented

concept (e.g., starting with the word "summer", a possible chain could be: "computer, banana, bicycle, ..."). Therefore, this task is slightly more difficult than the association task. Participants completed two trials of one minute each. The starting concepts were: "Deep" and "Book." Validation of the answers was done in the exact same way as the association task with two independent judges. Inter-rater agreement was $ICC = .94$ for both items.

General Self-Efficacy. General self-efficacy was assessed using the questionnaire of Chen, Gully, and Eden (2001; 8 items). An example item includes "I will be able to achieve most of the goals that I have set for myself." The content validity, unidimensional structure, discriminant validity against self-esteem, and internal reliability ($\alpha = .85$ and test-retest $r = .86$) of the scale was examined by Chen et al., (2001) across three studies. A composite score was obtained by averaging the items of the scale ($\alpha = .90$). Participants answered on a 5-points scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*).

Creative Self-Efficacy and Creative Personal Identity. The Short Scale of Creative Self (11 items; Karwowski, 2012) was employed to assess creative self-efficacy (six items; $\alpha = .82$) and creative personal identity (five items; $\alpha = .91$). An example item of creative self-efficacy includes "I trust my creative abilities." An example item of creative self-identity includes "My creativity is important to who I am." Participants answered on a 5-points scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*). The two-factors structure of the scale and its convergent, divergent, and predictive validity have been demonstrated in a validation study across five samples (Karwowski et al., 2018).

Plan of Analyses

As per Study 1, we used a multivariate multiple regression model with perfectionism and excellencism simultaneously predicting the eight dependant variables: originality, fluency, association, dissociation, openness to experience, general self-efficacy, creative self-efficacy and creative personal identity.

Results

Preliminary Analyses

Percentage of missing values ranged from 0% to 9.4% (for the dissociation score). The missing values were participants who either provided no answer or did not properly understand the task according to the judges. Because these later participants properly answered the other tasks, we kept them in our analyses. The missing values were *not* missing completely at random (Little's MCAR test: $\chi^2(54) = 95.68, p < .001$). Missing data was handled via Full Information Maximum Likelihood (FIML) estimator.

The descriptive statistics and correlations for the main variables are reported in Table 3. We see that all variables have acceptable degrees of skewness. We note that excellencism and perfectionism are correlated with one another ($r = .35, p < .001$). Similar correlations were observed between originality and fluency ($r = .34, p < .001$) and between association and dissociation ($r = .46, p < .001$).

Main Analyses

The results of the multivariate multiple regression (see Table 4) for originality, fluency, and openness to experience successfully replicated Study 1. That is, excellencism was a significant positive predictor of originality ($\beta = .15, p = .003$), fluency ($\beta = .22, p < .001$), and openness to experience ($\beta = .39, p < .001$), whereas

perfectionism was a significant negative predictor of originality ($\beta = -.18, p = .001$), fluency ($\beta = -.13, p = .012$), and openness to experience ($\beta = -.21, p < .001$). As shown in Table 4, the predictors together explained 3.9%, 4.7% and 14% of the variance in the dependant variables, respectively.

The results for association and dissociation suggested similar conclusions. Excellencism was a significant positive predictor of association ($\beta = .16, p = .007$) and dissociation ($\beta = .15, p = .005$), whereas perfectionism was a significant negative predictor of association ($\beta = -.20, p < .001$) and dissociation ($\beta = -.21, p < .001$). Together, the two predictors explained 4.4% and 4.7% of the variance in those variables, respectively.

Finally, the results for general self-efficacy, creative self-efficacy, and creative personal identity were different from those of openness to experience. We observed that excellencism was a significant and substantial positive predictor of all three, whereas perfectionism was not significantly related to these dependent variables. Specifically, excellencism was a positive predictor of general self-efficacy ($\beta = .50, p < .001$), creative self-efficacy ($\beta = .40, p < .001$), and creative personal identity ($\beta = .29, p < .001$). Perfectionism was non-significantly related to general self-efficacy ($\beta = .03, p = .47$), creative self-efficacy ($\beta = -.09, p = .06$), and creative personal identity ($\beta = -.09, p = .09$). The two predictors explained 26%, 14% and 7.4% of the variance in those personality variables, respectively.

Predicted Values for Subtypes of Strivers

Predicted values from the regression model are presented for the three subtypes of strivers (see Figure 2 panel A-H). It can be seen that excellence strivers have significantly

higher predicted values in comparison to perfection strivers and non-strivers on all dependent variables except for general self-efficacy, creative self-efficacy, and creative personal identity (excellence strivers and perfection strivers were not significantly different on these three variables). More specifically, the standardized differences between excellence and perfection strivers were significant with respect to originality ($d = 0.37$ [0.14, 0.59], $p = .001$), fluency ($d = 0.27$ [0.06, 0.48], $p = .011$), openness to experience ($d = 0.42$ [0.23, 0.61], $p < .001$), association ($d = 0.40$ [0.19, 0.62], $p < .001$), and dissociation ($d = 0.43$ [0.23, 0.63], $p < .001$). As mentioned, this difference did not reach statistical significance for general self-efficacy ($d = -0.07$ [-0.27, 0.12], $p = .47$), creative self-efficacy ($d = 0.18$ [-0.02, 0.38], $p = .07$), and creative personal identity ($d = 0.17$ [-0.03, 0.38], $p = .09$).

Excellence strivers were significantly higher than non-strivers on all eight dependent variables, namely originality ($d = 0.31$ [0.10, 0.53], $p = .004$), fluency ($d = 0.44$ [0.24, 0.65], $p < .001$), openness to experience ($d = 0.79$ [0.60, 0.97], $p < .001$), association ($d = 0.31$ [0.08, 0.55], $p = .007$), dissociation ($d = 0.30$ [0.08, 0.51], $p = .006$), general self-efficacy ($d = 0.99$ [0.82, 1.17], $p < .001$), creative self-efficacy ($d = 0.80$ [0.63, 0.98], $p < .001$), and creative personal identity ($d = 0.57$ [0.41, 0.74], $p < .001$).

Lastly, the difference between perfection strivers and non-strivers did not reach statistical significance with respect to originality ($d = -0.06$ [-0.29, 0.18], $p = .64$) and fluency ($d = 0.17$ [-0.08, 0.43], $p = .18$), but perfection strivers were significantly higher on openness to experience ($d = 0.37$ [0.15, 0.59], $p = .001$). Moreover, both strivers were not significantly different on association ($d = -0.09$ [-0.35, 0.17], $p = .50$) and dissociation ($d = -0.13$ [-0.37, 0.11], $p = .29$), but perfection strivers were significantly

higher on general self-efficacy ($d = 1.07 [0.85, 1.29]$, $p < .001$), creative self-efficacy ($d = 0.62 [0.39, 0.85]$, $p < .001$) and creative personal identity ($d = 0.40 [0.16, 0.64]$, $p = .001$).

Brief Discussion

Study 2 successfully replicated the findings of Study 1. Notably, in both studies, excellencism was a positive predictor of divergent thinking (originality and fluency) and openness to experience, whereas perfectionism was a negative predictor of these variables. In addition, Study 2 showed that this pattern generalized to tasks of associative abilities, in which excellence strivers were more fluent in generating chains of unrelated words compared to perfection strivers. Excellence strivers were found to be 0.27 (for fluency) to 0.43 (for dissociation) standard deviation above perfection strivers on divergent thinking and associative abilities indicators. The effect sizes were moderate and comparable to the average correlational effect size found in personality research (Bosco et al., 2015). Perfection strivers relative to non-strivers were not significantly different on these indicators. These results supported the view that perfectionism over and above excellencism is detrimental with respect to indicators of creativity. Overall, these findings replicate and extend those of Study 1, while being consistent across measurements of perfectionism and excellencism at the domain-specific and dispositional levels.

Our additional personality measurements suggested a nuanced position. The picture depicted by individual differences on self-reported measures revealed that perfectionism, over and above excellencism, has a neutral effect with respect to general self-efficacy, creative self-efficacy, and creative personal identity. In other words, perfection and excellence strivers were not significantly different on those variables.

Taken together, these findings suggest that perfection and excellence strivers are both associated with high levels of general and creative self-efficacy beliefs and a creative identity. Surprisingly, among the four self-reported measures, only openness to experience was able to differentiate excellence strivers from perfection strivers. This latter finding is consistent with the results of Study 1.

General Discussion

Perfectionists are often portrayed as expressing a cognitive, attitudinal or behavioral rigidity (Egan et al., 2007; Ferrari & Mautz, 1997; Hollender, 1965). Nevertheless, their extremely high standards are sometimes thought to contribute to greater achievements and perseverance in competitive and challenging environments. The recent operationalization of excellencism as a characteristic that involves high standards without perfectionistic attitudes offers a more nuanced approach to the question of whether perfectionistic standards are beneficial, deleterious or neutral in relation to creative thinking potential and subjective indicators of creativity (e.g., Gaudreau, 2019). Consequently, we conducted two studies to investigate this question. We found that perfectionistic standards over and above excellencism were deleterious with respect to divergent thinking, associative abilities, and openness to experience, but neutral with respect to general self-efficacy, creative self-efficacy, and creative personal identity.

Across both studies, the effect sizes replicated for the divergent thinking scores but it can be noticed that excellencism was more highly related to Openness to experience in Study 2 ($\beta = .39$) compared to Study 1 ($\beta = .17$). One account for this difference is the use of two different scales to measure openness to experience in Study 1 and Study 2. In Study 1, the IPIP-NEO scale possessed more questions referring to emotionality (e.g., I

experience my emotions intensely), liberalism (e.g., I believe that there is no absolute right or wrong), and adventurousness (e.g., I like to visit new places.). Whereas the scale of Study 2 (Big Five Aspect Scales) focusses more on Intellect (e.g., I like to solve complex problems) and Openness (e.g., I believe in the importance of arts). Excellencism could be associated with Intellect—which captures an interest for intellectual challenges— more so than the other facets of the overarching trait Openness to experience. A scale that gives more weight to Intellect would thus strengthen the correlation with excellencism. For instance, post-hoc partial correlations with the data of Study 2 suggest that excellencism correlates more strongly with Intellect ($r = .40$) than with the subfactor Openness ($r = .23$) of the Big Five Aspect Scale, while controlling for perfectionism. The relationship between the Intellect dimension and excellencism could be investigated in future studies.

Divergent Thinking and Associative Abilities

Divergent thinking is a mode of thinking concerned with the generation of variations (Guilford, 1950). Being able to keep finding variations without running out of idea is the essence of divergent thinking abilities. In the current study, participants had to generate many original utilities for simple objects such as a brick. The best-two answers of participants were used to estimate their maximal level of creative potential, while this coding method also limited the confounding effect of the number of answers on their scores. Likewise, the associative tasks introduced in Study 2 required participants to constantly switch between semantic categories in order to generate new words unrelated to previous ones.

Both tasks call for an efficient search within a space of remote and weakly connected concepts. For instance, Gilhooly et al. (2007) identified effective cognitive strategies associated with higher scores of originality on divergent thinking tasks. These strategies — such as considering the target item against a broad category — are effective because they allow to focus on some properties of the target item, which then have their own links with other concepts (e.g., could the target item be used as a transportation vehicle?). In another vein, He and colleagues (2020), relying on network science methodologies, demonstrated that verbal divergent thinking — but not figural divergent thinking — was associated with higher connectivity and shorter distances between concepts in participants' memory structure. Interestingly, a study by Christensen and colleagues (2018) showed that individuals higher on openness to experience also had more flexible and interconnected semantic memory structures, as well as more efficient retrieval abilities of associated concepts. Taken together, these findings suggest that differences in strategies and/or in memory structures could account for the better performance of excellence strivers on both divergent and associative tasks compared to perfection strivers and non-strivers.

At least three different but related processes could explain the creativity gap that we observed with perfection strivers. First, perfection strivers may focus too much on the need to rapidly achieve a perfect outcome. *Goal setting theory* suggests that performance goals foster motivation and effort, but may reduce performance on novel and difficult tasks by emphasising the execution of acquired strategies rather than looking for new and adaptive ones (Locke & Latham, 2002). Exploring novel and uncertain strategies could be perceived as incompatible with perfect performances right from the start. As such,

perfection strivers may feel an urge to stick to conventional strategy in order to handle their intolerance for uncertainty (Cheek & Goebel, 2020) and to satisfy their desire to avoid failure (Gaudreau et al., 2021). If so, they may end up being stuck in a suboptimal strategy which would minimize their capacity to think in a divergent manner. Second, perfection strivers may fail to immerse themselves deeply into the process of letting original ideas naturally emerge in a free-flowing manner. People with high levels of perfectionistic standards tend to be overly analytical, judgmental, or critical of their answers (Flett, Hewitt, Nepon & Besser, 2018), which could easily disrupt their flow of associative and original thinking. Third, perfectionistic standards have recently been proposed to be the core definitional feature of perfectionism that activates and gives fuel to the enactment of cognitive, socio-cognitive, and socio-behavioral expressions of perfectionism (Gaudreau, 2021). For example, perfection strivers are more likely to experience doubts about their actions and evaluative concerns in ways that could disrupt their task engagement, concentration, and creativity. Together or in isolation, these tendencies could easily explain why perfection strivers were less fluent while performing the task and why they produced a significantly lower number of original answers and associations.

Perfectionism and Creativity: A Problem of Compatibility?

Despite perfectionistic standards being univocally detrimental to objective indicators of divergent and associative thinking, the portrait with subjective variables was mixed. We found that perfectionistic standards were associated with reduced openness to experience. However, perfection strivers and excellence strivers had similar scores of general self-efficacy, creative self-efficacy, and creative personal identity. Thus, both

strivers were generally confident in their ability to succeed, confident in their ability to produce creative ideas, and considered creativity as an important aspect of themselves. Yet, only excellence strivers actually exhibited greater divergent thinking and associative abilities.

What may explain this disconnect between the performance of perfection strivers and their self-evaluations? One possibility is a bias in self-reported responses due to social desirability. Another possibility involves protective mechanisms of one's self-esteem and self-efficacy. A recent study showed that perfection strivers have highly paradoxical personalities (BLINDED). Results showed that they were more likely to be over-involved and impatient (i.e., type A behaviors) while being less likely to improve their performance over time and reach the highest possible levels of achievement. While doubting and being concerned about their actions, they also expressed an exaggerated positive view of themselves (i.e., narcissistic perfectionism). They simultaneously considered themselves as competent while feeling eternally unsatisfied about their achievement; for them, it is never good enough (Flett & Hewitt, 2002; Hill & Curran, 2016). In this study, we found that perfection strivers seem to consider creativity as an important aspect of their identity, yet they were less open to experience. Arguably, being open to experience is an essential part of the creative process and the creative identity (Feist, 1998; Jauk, 2019; Rhodes, 1961). It is possible that perfection strivers misunderstand what the process of creativity really entails. Perhaps perfection strivers are equating the concept of creativity with their perceived proficiency in handling complex and difficult problems. However, divergent and associative thinking are not fundamentally complex nor difficult problems to handle. The challenge of these tasks

stems from a necessity to be autonomous while searching for alternatives. In short, perfection strivers might be more narrowly creative than they are aware of. In other words, their perceived creativity could stem from them being creative only within their field of expertise, at the expense of low adaptability to remote problems and situations. This would account for why perfection strivers perceived themselves as creative despite having lower scores on divergent thinking and associative tasks.

Another interpretation involves the dimension of perfectionistic concerns, which we did not assess in this study. The many doubts and concerns captured by this dimension often accompanies perfectionistic standards and might deprive one's working memory capacity while performing creativity tasks (Besser et al., 2004; Flett et al., 2002; Whitmer & Gotlib, 2013). The MEP assumes that perfectionistic standards set the wheel in motion for the enactment of the many cognitive (e.g., doubts), socio-cognitive (e.g., perceived social pressure), and socio-behavioral (e.g., showcasing an image of perfection to others) likely to prevent individuals from fully immersing themselves into a task (Gaudreau, 2021). The saturation of working memory by intrusive thoughts and evaluative concerns could account for the inferior performance of perfection strivers on cognitive tasks (Eum & Rice, 2011). This suggests that worries, concerns, negative self-talk, ruminative thoughts, and even self-presentation concerns could mediate the relation between perfectionistic standards and reduced performances on cognitive tasks. Overall, the MEP reiterates that perfectionism is multidimensional with evaluative concerns being one of the signature expressions closely associated with increased risk of psychological malfunctioning (Gaudreau, 2021).

In addition, the time constraint on our tasks may have exacerbated the negative effect for perfection strivers. Time limits can be seen as threatening and distracting, especially for people who tend to overinvest their time and energy in order to succeed at their desired level. Past studies with time constraints reported a negative effect of perfectionistic standards (e.g., Eum & Rice, 2010; Stoeber et al., 2008) that contrasts with the small but positive effect reported in a recent meta-analytical review (Madigan, 2019). “Perfectionism is the enemy of done” because perfection strivers often prefer to take additional time on task in the hope of delivering a perfect product. Future studies could examine perfectionistic standards in relation to creative indicators under timed and non-timed conditions.

Limitations and Future Research

In this study, we relied on a correlational design and the effects that we observed cannot be interpreted as causal effects on creativity. However, perfectionistic standards and excellencism are a blueprint that shapes the beliefs, emotions, and actions of individuals across many areas of their lives. As such, it is highly unlikely that creativity biased or influenced the measurement of perfectionism and excellencism inasmuch as our creativity tasks were performed after participants completed the self-reported measures. Nonetheless, future research using an experimental design could try to temporarily induce perfectionistic standards and excellencism (Boone & Soenens, 2015) by changing the instructions given at the start of the creativity task. Alternatively, researchers could reassess the creativity of participants after an intervention to determine if reducing one’s perfectionism (Lloyd et al., 2015) result in positive change only in participants randomized in the experimental condition. Excellencism and perfectionism are

moderately correlated. This correlation is theoretically expected because people who pursue perfection incidentally pursue excellence in their quest toward perfection (Gaudreau, 2019). However, some of the correlation could also be attributable to shared method variance because they both are measured with the same method in the same questionnaire. Future studies should try to measure perfectionistic standards and excellencism using both self-report and informant reports. Best friends, lovers, and family members are potentially capable of assessing excellencism and perfectionism of close others (Flett et al., 2005), but this assumption remains an open question for future research.

Another limit of this study comes from the small number of associative tasks and the narrow conceptual reach of our divergent thinking items, which may have hindered the generalizability or ecological validity of our results. However, the replication of the divergent thinking results across two samples as well as the comparable size of the effect among the divergent and associative tasks contribute to the robustness of our findings. Future research should nonetheless expend and diversify the creativity tasks in order to determine the extent to which the effects observed in this study are applicable across the whole spectrum of creativity performances in the lab and in real life settings.

This study exclusively focused on the direct associations of excellencism and perfectionistic standards with creative indicators. Future research should examine the mechanisms that potentially contribute to these effects. Immediately after each trial, participants could be asked to evaluate their thoughts, feelings, and cognitive strategies while they were doing the divergent and associative thinking tasks. Alternatively, physiological markers of threat and challenge (Blascovich, 2008) could be captured to

evaluate the extent to which avoidance and approach motivational states are differentially activated by perfectionistic standards and excellencism, in ways that could mediate the effects that we observed in our study.

Finally, the rigidity of perfectionistic standards— as well as the socio-cognitive and behavioral correlates which accompanies those standards — might differ considerably in different environments. For example, standards of perfection in dance, especially in classical ballet, have an history of being stringent (Nordin-Bates et al., 2011). The culture and the implicit norms of an environment could accentuate the disadvantage of being a perfection striver on creative thinking. Indicators of creativity can have increasing degrees of domain specificity while perfectionistic standards in one domain (e.g., school) may fail to predict creativity across all domains of creativity. In our study, the measurement of perfectionism and excellencism (i.e., school and dispositional) did not match the specificity of the creativity measures (i.e., semantic). Therefore, it would be interesting to examine if the effects of perfectionistic standards and excellencism generalize across various domains of creativity. In particular, future research could try to measure perfectionistic standards and excellencism for creative domains to determine if performing artists have elevated perfectionistic standards in artistic domains compared to their general lives.

Conclusion

The extant literature on perfectionism remained unclear about whether perfectionism is “killing” or facilitating creativity. Across two studies, we found supportive evidence for the idea that perfectionistic standards are negatively associated with creative performance, once we separate the effects of excellencism from those of

perfectionism. Striving for perfection over and above excellence is likely to limit experimentation, spontaneity, and openness. Relaxing the perfection constraint means changing the narrative so that it becomes “okay if it isn’t always perfect” (Nordin-Bates, 2020, p. 31). As such, our findings suggest that excellencism could be a suitable alternative to the pursuit of perfectionistic standards.

Overall, these findings illustrate the usefulness of the Model of Excellencism and Perfectionism (Gaudreau, 2019). Future research should carefully investigate if the effects of perfectionistic standards, over and above excellencism, are similar when it comes to predict real-life outcomes such as the life-long productivity and best-ever creative production of individuals who are frequently creative (e.g., musicians, dancers, writers, scientists).

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References

- Ahmetoglu, G., Harding, X., Akhtar, R., & Chamorro-Premuzic, T. (2015). Predictors of Creative Achievement : Assessing the Impact of Entrepreneurial Potential, Perfectionism, and Employee Engagement. *Creativity Research Journal*, 27(2), 198-205. <https://doi.org/10.1080/10400419.2015.1030293>
- Amabile, T. M. (2001). John Irving and the Passionate Craft of Creativity. *American Psychologist*, 4.
- Beaty, R. E., Silvia, P. J., Nusbaum, E. C., Jauk, E., & Benedek, M. (2014). The roles of associative and executive processes in creative cognition. *Memory & Cognition*, 42(7), 1186-1197. <https://doi.org/10.3758/s13421-014-0428-8>
- Benedek, M., & Fink, A. (2019). Toward a neurocognitive framework of creative cognition : The role of memory, attention, and cognitive control. *Current Opinion in Behavioral Sciences*, 27, 116-122. <https://doi.org/10.1016/j.cobeha.2018.11.002>
- Benedek, M., Könen, T., & Neubauer, A. C. (2012). Associative abilities underlying creativity. *Psychology of Aesthetics, Creativity, and the Arts*, 6(3), 273-281. <https://doi.org/10.1037/a0027059>
- Besser, A., Flett, G. L., & Hewitt, P. L. (2004). Perfectionism, Cognition, and Affect in Response to Performance Failure vs. Success. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 22(4), 297-324. <https://doi.org/10.1023/B:JORE.0000047313.35872.5c>
- Bissonnette, V., Ickes, W., Bernstein, I. H., & Knowles, E. (1990). Personality moderating variables: A warning about statistical artifact and a comparison of

analytic techniques. *Journal of Personality*, 58, 567-587.

<https://doi.org/10.1111/j.1467-6494.1990.tb00243.x>

Blasberg, J. S., Hewitt, P. L., Flett, G. L., Sherry, S. B., & Chen, C. (2016). The Importance of Item Wording : The Distinction Between Measuring High Standards Versus Measuring Perfectionism and Why It Matters. *Journal of Psychoeducational Assessment*, 34(7), 702-717.

<https://doi.org/10.1177/0734282916653701>

Blascovich, J. (2008). Challenge, threat, and health. In *Handbook of motivation science* (p. 481-493). The Guilford Press.

Boone, L., & Soenens, B. (2015). In double trouble for eating pathology? An experimental study on the combined role of perfectionism and body dissatisfaction. *Journal of Behavior Therapy and Experimental Psychiatry*, 47, 77-83. <https://doi.org/10.1016/j.jbtep.2014.11.005>

Bosco, F. A., Aguinis, H., Singh, K., Field, J. G., & Pierce, C. A. (2015). Correlational effect size benchmarks. *Journal of Applied Psychology*, 100(2), 431-449. <https://doi.org/10.1037/a0038047>

Carson, S. H., Peterson, J. B., & Higgins, D. M. (2005). Reliability, Validity, and Factor Structure of the Creative Achievement Questionnaire. *Creativity Research Journal*, 17(1), 37-50. https://doi.org/10.1207/s15326934crj1701_4

Chang, H.-T., Chou, Y.-J., Liou, J.-W., & Tu, Y.-T. (2016). The effects of perfectionism on innovative behavior and job burnout : Team workplace friendship as a moderator. *Personality and Individual Differences*, 96, 260-265. <https://doi.org/10.1016/j.paid.2016.02.088>

- Cheek, N. N., & Goebel, J. (2020). What does it mean to maximize? “Decision difficulty,” indecisiveness, and the jingle-jangle fallacies in the measurement of maximizing. *Judgment and Decision Making*, 15(1), 7-24.
- Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a New General Self-Efficacy Scale. *Organizational Research Methods*, 4(1), 62-83.
<https://doi.org/10.1177/109442810141004>
- Chou, C.-C., Huang, M.-Y., Lin, T.-W., Lu, F. J.-H., Chiu, Y.-H., & Chen, J.-F. (2019). Moderating Effect of Self-Esteem on the Relationship between Perfectionism and Creative Thinking among Collegiate Dancers. *Creativity Research Journal*, 31(2), 188-197. <https://doi.org/10.1080/10400419.2019.1606620>
- Christensen, A. P., Kenett, Y. N., Cotter, K. N., Beaty, R. E., & Silvia, P. J. (2018). Remotely Close Associations : Openness to Experience and Semantic Memory Structure. *European Journal of Personality*, 32(4), 480-492.
<https://doi.org/10.1002/per.2157>
- Cousineau, D. (2017). Varieties of Confidence Intervals. *Advances in Cognitive Psychology*, 13(2), 140-155. <https://doi.org/10.5709/acp-0214-z>
- da Costa, S., Páez, D., Sánchez, F., Garaigordobil, M., & Gondim, S. (2015). Personal factors of creativity : A second order meta-analysis. *Revista de Psicología Del Trabajo y de Las Organizaciones*, 31(3), 165-173.
<https://doi.org/10.1016/j.rpto.2015.06.002>
- Cramond, B., Matthews-Morgan, J., Bandalos, D., & Zuo, L. (2016). A Report on the 40-Year Follow-Up of the Torrance Tests of Creative Thinking: Alive and Well in

the New Millennium. *Gifted Child Quarterly*, 49(4), 283-291.

<https://doi.org/10.1177/001698620504900402>

Cumming, G., & Finch, S. (2005). Inference by Eye: Confidence Intervals and How to Read Pictures of Data. *American Psychologist*, 60(2), 170–180.

<https://doi.org/10.1037/0003-066X.60.2.170>

DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains : 10 aspects of the Big Five. *Journal of Personality and Social Psychology*, 93(5), 880-896. <https://doi.org/10.1037/0022-3514.93.5.880>

Efron, B., & Tibshirani, R. (1993). *An introduction to the bootstrap*. Chapman & Hall.

Egan, S. J., Piek, J. P., Dyck, M. J., & Rees, C. S. (2007). The role of dichotomous thinking and rigidity in perfectionism. *Behaviour Research and Therapy*, 45(8), 1813-1822. <https://doi.org/10.1016/j.brat.2007.02.002>

Eum, K., & Rice, K. G. (2011). Test anxiety, perfectionism, goal orientation, and academic performance. *Anxiety, Stress & Coping*, 24(2), 167-178.

<https://doi.org/10.1080/10615806.2010.488723>

Feist, G. J. (1998). A Meta-Analysis of Personality in Scientific and Artistic Creativity. *Personality and Social Psychology Review*, 2(4), 290-309.

https://doi.org/10.1207/s15327957pspr0204_5

Ferrari, J. R., & Mautz, W. T. (1997). Predicting Perfectionism : Applying Tests of Rigidity. *Journal of Clinical Psychology*, 6.

Fletcher, K. L., & Neumeister, K. L. S. (2017). *Perfectionism in school: When achievement is not so perfect*. Momentum Press.

- Flett, G. L., Besser, A., & Hewitt, P. L. (2005). Perfectionism, ego defense styles, and depression: A comparison of self-peports versus informant ratings. *Journal of Personality*, 73, 1355-1396. <https://doi.org/10.1111/j.1467-6494.2005.00352.x>
- Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment : An overview of theoretical, definitional, and treatment issues. In G. L. Flett & P. L. Hewitt (Éds.), *Perfectionism : Theory, research, and treatment*. (p. 5-31). American Psychological Association. <https://doi.org/10.1037/10458-001>
- Flett, G. L., Hewitt, P. L., Nepon, T., & Besser, A. (2018). Perfectionism cognition theory: The cognitive side of perfectionism. In J. Stoeber (Ed.), *The Psychology of Perfectionism: Theory, Research, Applications* (pp. 89-110). Routledge.
- Flett, G. L., Madorsky, D., Hewitt, P. L., & Heisel, M. J. (2002). Perfectionism Cognitions, Rumination, and Psychological Distress. *Behavior Therapy*, 15.
- Forthmann, B., Szardenings, C., & Holling, H. (2020). Understanding the confounding effect of fluency in divergent thinking scores : Revisiting average scores to quantify artifactual correlation. *Psychology of Aesthetics, Creativity, and the Arts*, 14(1), 94-112. <https://doi.org/10.1037/aca0000196>
- Frache, V., & Gaudreau, P. (2016). Integrating dispositional perfectionism and within-person variations of perfectionism across life domains into a multilevel extension of the 2 × 2 model of perfectionism. *Personality and Individual Differences*, 89, 55-59. <https://doi.org/10.1016/j.paid.2015.09.046>
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, 14(5), 449–468. <https://doi.org/10.1007/BF01172967>

Gallucci, N. T., Middleton, G., & Kline, A. (2000). Perfectionism and Creative Strivings.

The Journal of Creative Behavior, 34(2), 135-141. <https://doi.org/10.1002/j.2162-6057.2000.tb01206.x>

Gaudreau, P. (2012). A methodological note on the interactive and main effects of

dualistic personality dimensions : An example using the 2×2 model of perfectionism. *Personality and Individual Differences*, 52(1), 26-31.

<https://doi.org/10.1016/j.paid.2011.08.022>

Gaudreau, P. (2019). On the Distinction Between Personal Standards Perfectionism and

Excellencism : A Theory Elaboration and Research Agenda. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*,

14(2), 197-215. <https://doi.org/10.1177/1745691618797940>

Gaudreau, P. (2021). Separating the core definitional feature and the signature

expressions of dispositional perfectionism: Implications for theory, research, and practice. *Personality and Individual Differences*, 181, 110975.

<https://doi.org/https://doi.org/10.1016/j.paid.2021.110975>

Gaudreau, P., & Schellenberg, B. (2018). Scale of Perfectionism and Excellencism

(SCOPE) [Measurement instrument].

Gaudreau, P., Boileau, L., & Schellenberg, B. J. I. (2021). Peur de l'échec à l'école et

dans les sports: Apport du modèle de l'excellencisme et du perfectionnisme [Fear of failure in sport and school: Contribution of the model of excellencism and perfectionism]. *Revue Quebecoise de Psychologie*.

Gilhooly, K. J., Fioratou, E., Anthony, S. H., & Wynn, V. (2007). Divergent thinking :

Strategies and executive involvement in generating novel uses for familiar

objects. *British Journal of Psychology*, 98(4), 611-625.

<https://doi.org/10.1111/j.2044-8295.2007.tb00467.x>

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. *Personality psychology in Europe*, 7(1), 7-28.

Goldstein, H., & Healy, M. J. R. (1995). The Graphical Presentation of a Collection of Means. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, 158(1), 175–177. <https://doi.org/10.2307/2983411>

Greenspon, T. S. (2000). “Healthy Perfectionism” is an Oxymoron! : Reflections on the Psychology of Perfectionism and the Sociology of Science. *Journal of Secondary Gifted Education*, 11(4), 197-208. <https://doi.org/10.4219/jsge-2000-631>

Guilford, J. (1950). Creativity. *American Psychologist*, 5(9), 444-454.

Guilford, J. P. (1967). *The nature of human intelligence*. McGraw-Hill.

Harari, D., Steed, L. B., Swider, B. W., & Breidenthal, A. P. (2018). *Is Perfect Good ? A Meta-Analysis of Perfectionism in the Workplace*. 24.

Hass, R. W. (2017). Semantic search during divergent thinking. *Cognition*, 166, 344-357. <https://doi.org/10.1016/j.cognition.2017.05.039>

He, L., Kenett, Y. N., Zhuang, K., Liu, C., Zeng, R., Yan, T., Huo, T., & Qiu, J. (2020).

The relation between semantic memory structure, associative abilities, and verbal and figural creativity. *Thinking & Reasoning*, 1-26.

<https://doi.org/10.1080/13546783.2020.1819415>

- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: conceptualization, assessment, and association with psychopathology. *Journal of personality and social psychology*, 60(3), 456.
- Hill, A. P., & Curran, T. (2016). Multidimensional Perfectionism and Burnout : A Meta-Analysis. *Personality and Social Psychology Review*, 20(3), 269-288.
<https://doi.org/10.1177/1088868315596286>
- Hill, A. P., & Madigan, D. J. (2017). A short review of perfectionism in sport, dance and exercise: Out with the old, in with the 2×2. *Current Opinion in Psychology*, 16, 72-77. <https://doi.org/10.1016/j.copsyc.2017.04.021>
- Hollender, M. H. (1965). Perfectionism. *Comprehensive Psychiatry*, 6(2), 94-103.
[https://doi.org/10.1016/S0010-440X\(65\)80016-5](https://doi.org/10.1016/S0010-440X(65)80016-5)
- Jauk, E. (2019). A bio-psycho-behavioral model of creativity. *Current Opinion in Behavioral Sciences*, 27, 1-6. <https://doi.org/10.1016/j.cobeha.2018.08.012>
- Johnson, J. A. (2014). Measuring thirty facets of the Five Factor Model with a 120-item public domain inventory: Development of the IPIP-NEO-120. *Journal of Research in Personality*, 51, 78–89. <https://doi.org/10.1016/j.jrp.2014.05.003>
- Joy, S., & Hicks, S. (2004). The Need to Be Different : Primary Trait Structure and Impact on Projective Drawings. *Creativity Research Journal*, 16(2-3), 331-339.
<https://doi.org/10.1080/10400419.2004.9651462>
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct? *Journal of Personality and Social Psychology*, 83(3), 693-710. <https://doi.org/10.1037/0022-3514.83.3.693>

- Karwowski, M. (2012). Did Curiosity Kill the Cat? Relationship Between Trait Curiosity, Creative Self-Efficacy and Creative Personal Identity. *Europe's Journal of Psychology*, 8(4). <https://doi.org/10.5964/ejop.v8i4.513>
- Karwowski, M., & Barbot, B. (2016). Creative self-beliefs: Their nature, development, and correlates. In *Creativity and reason in cognitive development, 2nd ed* (pp. 302–326). Cambridge University Press.
<https://doi.org/10.1017/CBO9781139941969.016>
- Karwowski, M., Lebuda, I., & Wisniewska, E. (2018). Measuring Creative Self-efficacy and Creative Personal Identity. *The Journal of Creativity and Problem Solving*, 28, 45–57.
- Kehayes, I.-L. L., Smith, M. M., Sherry, S. B., Vidovic, V., & Saklofske, D. H. (2019). Are perfectionism dimensions risk factors for bulimic symptoms? A meta-analysis of longitudinal studies. *Personality and Individual Differences*, 138, 117-125. <https://doi.org/10.1016/j.paid.2018.09.022>
- Kim, S. L., Kim, M., & Yun, S. (2017). What do we need for creativity? The interaction of perfectionism and overall justice on creativity. <https://doi.org/10.1108/PR-06-2015-0187>
- Limburg, K., Watson, H. J., Hagger, M. S., & Egan, S. J. (2017). The Relationship Between Perfectionism and Psychopathology : A Meta-Analysis. *Journal of Clinical Psychology*, 73(10), 1301-1326. <https://doi.org/10.1002/jclp.22435>
- Ljubin-Golub, T., Rijavec, M., & Jurčec, L. (2018). Flow in the Academic Domain: The Role of Perfectionism and Engagement. *The Asia-Pacific Education Researcher*, 27(2), 99–107. <https://doi.org/10.1007/s40299-018-0369-2>

- Lloyd, S., Schmidt, U., Khondoker, M., & Tchanturia, K. (2015). Can Psychological Interventions Reduce Perfectionism? A Systematic Review and Meta-analysis. *Behavioural and Cognitive Psychotherapy*, 43(6), 705-731.
<https://doi.org/10.1017/S1352465814000162>
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation : A 35-year odyssey. *American Psychologist*, 57(9), 705-717.
<https://doi.org/10.1037//0003-066X.57.9.705>
- Madigan, D. J. (2019). A Meta-Analysis of Perfectionism and Academic Achievement. *Educational Psychology Review*, 31(4), 967-989. <https://doi.org/10.1007/s10648-019-09484-2>
- Miller, A. L., Lambert, A. D., & Speirs Neumeister, K. L. (2012). Parenting Style, Perfectionism, and Creativity in High-Ability and High-Achieving Young Adults. *Journal for the Education of the Gifted*, 35(4), 344-365.
<https://doi.org/10.1177/0162353212459257>
- Missildine, W. H. (1963). Perfectionism—If you must strive to “do better.”. *Your inner child of the past*, 75, 90.
- Mouratidis, A., & Michou, A. (2011). Perfectionism, self-determined motivation, and coping among adolescent athletes. *Psychology of Sport and Exercise*, 12(4), 355-367. <https://doi.org/10.1016/j.psychsport.2011.03.006>
- Nordin-Bates, S. M. (2020). Striving for Perfection or for Creativity? *Journal of Dance Education*, 20(1), 23–34. <https://doi.org/10.1080/15290824.2018.1546050>
- Nordin-Bates, S. M., Cumming, J., Aways, D., & Sharp, L. (2011). Imagining Yourself Dancing to Perfection? Correlates of Perfectionism Among Ballet and

- Contemporary Dancers. *Journal of Clinical Sport Psychology*, 5(1), 58–76.
<https://doi.org/10.1123/jcsp.5.1.58>
- Osborn, A. F. (1963). *Applied imagination : Principles and procedures of creative problem-solving*. (3rd rev. ed.). Scribner.
- Osenk, I., Williamson, P., & Wade, T. D. (2020). Does perfectionism or pursuit of excellence contribute to successful learning? A meta-analytic review. *Psychological Assessment*, 32(10), 972-983. <https://doi.org/10.1037/pas0000942>
- Razumnikova, O. M. (2012). Divergent Thinking and Learning. In N. M. Seel (Éd.), *Encyclopedia of the Sciences of Learning* (p. 1028-1031). Springer US.
https://doi.org/10.1007/978-1-4419-1428-6_580
- Reiter-Palmon, R., Forthmann, B., & Barbot, B. (2019). Scoring divergent thinking tests: A review and systematic framework. *Psychology of Aesthetics, Creativity, and the Arts*, 13(2), 144–152. <https://doi.org/10.1037/aca0000227>
- Rhodes, M. (1961). An Analysis of Creativity. *The Phi Delta Kappan*, 42(7), 305-310.
- Runco, M. A., Abdulla, A. M., Paek, S. H., Al-Jasim, F. A., & Alsuwaidi, H. N. (2016). Which Test of Divergent Thinking Is Best? *Creativity. Theories – Research - Applications*, 3(1). <https://doi.org/10.1515/ctra-2016-0001>
- Runco, M. A., & Acar, S. (2012). Divergent Thinking as an Indicator of Creative Potential. *Creativity Research Journal*, 24(1), 66–75.
<https://doi.org/10.1080/10400419.2012.652929>
- Silvia, P. J., Martin, C., & Nusbaum, E. C. (2009). A snapshot of creativity : Evaluating a quick and simple method for assessing divergent thinking. *Thinking Skills and Creativity*, 4(2), 79-85. <https://doi.org/10.1016/j.tsc.2009.06.005>

- Silvia, P. J., Winterstein, B. P., Willse, J. T., Barona, C. M., Cram, J. T., Hess, K. I., Martinez, J. L., & Richard, C. A. (2008). Assessing creativity with divergent thinking tasks : Exploring the reliability and validity of new subjective scoring methods. *Psychology of Aesthetics, Creativity, and the Arts*, 2(2), 68-85.
<https://doi.org/10.1037/1931-3896.2.2.68>
- Simonton, D. K. (2014). Creative performance, expertise acquisition, individual differences, and developmental antecedents : An integrative research agenda. *Intelligence*, 45, 66-73. <https://doi.org/10.1016/j.intell.2013.04.007>
- Smith, M. M., Sherry, S. B., Rnic, K., Saklofske, D. H., Enns, M., & Gralnick, T. (2016). Are Perfectionism Dimensions Vulnerability Factors for Depressive Symptoms After Controlling for Neuroticism? A Meta-analysis of 10 Longitudinal Studies. *European Journal of Personality*, 30(2), 201-212.
<https://doi.org/10.1002/per.2053>
- Smith, M. M., Vidovic, V., Sherry, S. B., Stewart, S. H., & Saklofske, D. H. (2018). Are perfectionism dimensions risk factors for anxiety symptoms? A meta-analysis of 11 longitudinal studies. *Anxiety, Stress, & Coping*, 31(1), 4-20.
<https://doi.org/10.1080/10615806.2017.1384466>
- Somov, P. G. (2010). *Present Perfect : A Mindfulness Approach to Letting Go of Perfectionism and the Need for Control*. New Harbinger Publications.
- Starley, D. (2019). *Perfectionism : A challenging but worthwhile research area for educational psychology*. *Educational Psychology in Practice*, 35(2), 121-146.
<https://doi.org/10.1080/02667363.2018.1539949>

- Stoeber, J. (2014). Perfectionism in sport and dance : A double-edged sword.
International Journal of Sport Psychology, 45(4), 385-394.
- Stoeber, J., Chesterman, D., & Tarn, T.-A. (2010). Perfectionism and task performance:
Time on task mediates the perfectionistic strivings–performance relationship.
Personality and Individual Differences, 48(4), 458–462.
<https://doi.org/10.1016/j.paid.2009.11.021>
- Stoeber, J., Haskew, A. E., & Scott, C. (2015). Perfectionism and exam performance :
The mediating effect of task-approach goals. *Personality and Individual
Differences*, 74, 171-176. <https://doi.org/10.1016/j.paid.2014.10.016>
- Stoeber, J., Hutchfield, J., & Wood, K. V. (2008). Perfectionism, self-efficacy, and
aspiration level: Differential effects of perfectionistic striving and self-criticism
after success and failure. *Personality and Individual Differences*, 45, 323-327.
<https://doi.org/10.1016/j.paid.2008.04.021>
- Streiner, D. L. (2002). Breaking up is too hard to do: The heartbreak of dichotomizing
continuous data. *The Canadian Journal of Psychiatry*, 47, 262-266.
<https://doi.org/10.1177/070674370204700307>
- Tierney, P., & Farmer, S. M. (2002). Creative Self-Efficacy : Its Potential Antecedents
and Relationship to Creative Performance. *Academy of Management Journal*,
45(6), 1137-1148. <https://doi.org/10.2307/3069429>
- Vasasova, Z., & Lipkova, E. (2014). Relationship between Creativity and Perfectionism
in Secondary School Students. *The New Educational Review*, 38(4), 72-84.
- Wallach, A. M., & Kogan, N. (1965). *Modes of thinking in young children*.

- Whitmer, A. J., & Gotlib, I. H. (2013). An Attentional Scope Model of Rumination. *Psychological bulletin*, 139(5), 1036-1061. <https://doi.org/10.1037/a0030923>
- Wigert, B., Reiter-Palmon, R., Kaufman, J. C., & Silvia, P. J. (2012). Perfectionism : The good, the bad, and the creative. *Journal of Research in Personality*, 46(6), 775-779. <https://doi.org/10.1016/j.jrp.2012.08.007>
- Wood, R., & Bandura, A. (1989). *Impact of Conceptions of Ability on Self-Regulatory Mechanisms and Complex Decision Making*. 9.
- Xavier, A. M., Malavika, R., & Shibymol, C. B. Creativity and Perfectionism among Higher Secondary School Students. *Phonix International Journal for Psychology and Social Sciences*.
- Zeng, L., Proctor, R. W., & Salvendy, G. (2011). Can Traditional Divergent Thinking Tests Be Trusted in Measuring and Predicting Real-World Creativity? *Creativity Research Journal*, 23(1), 24–37. <https://doi.org/10.1080/10400419.2011.545713>

Table 1

Summary of the Correlations found between measures of Perfectionism and Creativity

Study	Sample	Measure of Perfectionism	Measure of Creativity	Correlation with perfectionism dimension
Miller et al. (2012)	323 honors' undergraduates	Hewitt & Flett MPS	SCAB ^{SR}	SPP = .05, SOP = -.02
Gallucci et al. (2000)	78 gifted adolescents	Frost MPS	WKOPAY ^{SR}	CM = -.23, DAA = -.51**, PS = .08
			SAM ^{SR}	CM = -.07, DAA = -.07, PS = .31**
Wigert et al. (2012; Study 1)	1336 undergraduates	Frost MPS	SAC ^{SR}	CM = .01, DAA = -.02, PS = .18**
			Bell curve ^{SR}	CM = -.08*, DAA = -.11**, PS = .11**
			CBI ^{SR}	CM = -.02, DAA = .01, PS = .08**
			CDQ-R ^{SR}	CM = -.03, DAA = .01, PS = .23**
			BICB ^{SR}	CM = -.04, DAA = -.03, PS = .10**
			Photo caption ^{DT}	CM = -.05, DAA = -.03, PS = .07*
Wigert et al. (2012, Study 2)	364 undergraduates	Frost MPS	Quality of solution ^{DT}	CM = -.02, DAA = -.03, PS = .08*
			Originality of solution ^{DT}	CM = .06, DAA = .004, PS = -.02
Kim et al. (2017)	131 employees	Hewitt & Flett MPS	Rated by supervisor	SPP = -.16**, SOP = .20*
Chang et al. (2016)	437 employees	APS-R	Innovative behavior ^{SR}	DISC = .03, PS = .30**

Table 1 *Continued*

Study	Sample	Measure of Perfectionism	Measure of Creativity	Correlation with perfectionism dimension
Chou et al. (2019)	226 collegiate dancers	Frost MPS	Verbal ^{DT}	CM = .30**, DAA = .27**, PS = .36**
			Figural ^{DT}	CM = .26**, DAA = .30**, PS = .30**
Vasasova & Lipkova (2014)	150 high school students	Frost MPS	Verbal ^{DT}	CM = .38**, DAA = .18*, PS = .41**
			Figural ^{DT}	CM = .14, DAA = .10, PS = .21*
Ferrari & Mautz (1997)	108 undergraduates	Hewitt & Flett MPS	Attitudinal flexibility ^{SR}	SPP = -.19*, SOP = -.43**
Egan et al. (2007)	40 clinical	PANPS	Attitudinal flexibility ^{SR}	NP = -.07, PP = .01
Egan et al. (2007)	111 athletes	PANPS	Attitudinal flexibility ^{SR}	NP = -.26**, PP = -.32**
Egan et al. (2007)	101 undergraduates	PANPS	Attitudinal flexibility ^{SR}	NP = -.28**, PP = -.38**
Ahmetoglu et al. (2015)	210 employees	Frost MPS	CAQ Arts & Science ^{SR}	Perfect = .05
			Entrepreneurial Creativity ^{SR}	Perfect = .09
Xavier et al. (2017)	200 high school students	Frost MPS	K-DOCS ^{SR}	Perfect = .11
Joy & Hicks (2004)	63 undergraduates	Unidimensional Cattell	Need to be different ^{SR}	Perfect = -.52**

Note. * $p < .05$, ** $p < .01$. Abbreviations in the last column refer to subscales of perfectionism. Indicators of perfectionistic concerns are: concerns over mistakes (CM), doubts about action (DAA), socially prescribed perfectionism (SPP), discrepancy (DISC), and negative perfectionism (NP). Indicators of perfectionistic standards are: personal standards (PS), self-oriented perfectionism (SOP), and positive perfectionism (PP). SR: measures of self-reported creativity. DT: measures of creativity based on divergent thinking

tasks. We excluded from further considerations the last four correlations in Table 1 because they were obtained with a unidimensional score of perfectionism.

Table 2

Descriptive Statistics and Bivariate Correlations of Study 1

Variable	Mean	SD	Skew	1	2	3	4
1.Excellencism (on 7)	5.66 [5.52, 5.80]	1.22 [1.12, 1.33]	−0.85 [−1.13, −0.56]	---			
2.Perfectionism (on 7)	4.18 [3.96, 4.39]	1.82 [1.68, 1.98]	−0.11 [−0.39, 0.17]	.51**	---		
3. Originality (on 5)	2.05 [2.00, 2.09]	0.40 [0.37, 0.44]	0.67 [0.38, 0.95]	.04	−.14*	---	
4. Fluency ^a	10.81 [10.01, 11.60]	6.75 [6.23, 7.36]	1.57 [1.28, 1.85]	.04	−.16*	.62**	---
5.Openness to experience (on 5)	3.35 [3.29, 3.40]	0.47 [0.43, 0.51]	0.18 [−0.10, 0.46]	.06	−.14*	.25**	.15*

Note. ^aFluency scores are not bounded and ranged from 3 to 40. 95% confidence intervals for the correlations are within $\pm .11$ from the point estimate. $N = 279$. ** $p < .01$. * $p < .05$

Table 3

Descriptive Statistics and Bivariate Correlations between the Main Variables of Study 2

Variable	Mean	SD	Skew	1	2	3	4	5	6	7	8	9
1. Excellencism (on 7)	5.80	0.95	−0.82	---								
2. Perfectionism (on 7)	3.87	1.61	0.05	.35**	---							
3. Originality (on 5)	1.99	0.42	0.44	.12*	−.11*	---						
4. Fluency ^a	12.60	4.9	0.47	.18**	−.05	.34**	---					
5. Openness to experience (on 5)	3.55	0.47	0.03	.34**	−.06	.27**	.13*	---				
6. Association ^b	7.98	3.46	0.59	.11*	−.12*	.38**	.44**	.13*	---			
7. Dissociation ^c	8.21	3.28	−0.05	.09	−.15*	.27**	.37**	.20**	.46**	---		
8. General self-efficacy (on 5)	3.74	0.66	−0.55	.54**	.22*	.03	.13*	.39**	.07	.05	---	
9. Creative self-efficacy (on 5)	3.74	0.70	−0.62	.40**	.06	.13**	.19**	.56**	.12*	.07	.51**	---
10. Creative personal identity (on 5)	3.73	0.97	−0.65	.28**	.02	.22	.13*	.53**	.08	.09	.29**	.76**

Note: ^a Fluency ranged from 1.5 to 29; ^b Association ranged from 1 to 21; ^c Dissociation ranged from 1 to 17.25. 95% confidence

intervals of the correlations are within +/− .10 from the point estimate. * $p < .05$, ** $p < .01$. $N = 401$.

Table 4

Standardized Coefficients from the Multiple Multivariate Regression for Study 2

Predictors	Cognitive variables				Personality variables			
	Originality	Fluency	Association	Dissociation	Openness	GSE	CSE	CPI
Excellencism	.15**	.22***	.16**	.15**	.40***	.50***	.40***	.29***
Perfectionism	-.18**	-.13*	-.20***	-.21***	-.21***	.04	-.09	-.09
R ²	3.9% [†]	4.7%*	4.4%*	4.7%*	14%***	26%***	14%***	7.4%**
R ² _{adj}	3.4%	4.2%*	3.9% [†]	4.2%*	14%***	26%***	14%***	7%**

Note. GSE: General Self-Efficacy. CSE: Creative Self-Efficacy. CPI: Creative Personal Identity. [†] $p = .051$, * $p < .05$, ** $p < .01$, *** $p < .001$. $N = 401$

Figure 1

Predicted Values of Originality, Fluency and Openness to experience in Study 1 with 95% Difference-Adjusted Confidence Intervals

[Note: non-overlapping confidence intervals represent statistically significant difference at $p < .05$. Y-Axis values are arbitrarily fixed]

Figure 2

Predicted Values for the Dependent Variables of Study 2 with 95% Difference-Adjusted Confidence Intervals [Note: non-overlapping confidence intervals represent statistically significant difference at $p < .05$. Y-Axis values are arbitrarily fixed]