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Stoeber, J., & Kersting, M. (2007). Perfectionism and aptitude test performance: Testees who strive for perfection achieve better test results. *Personality and Individual Differences*, 42, 1093-1103.

Perfectionism and Aptitude Test Performance:
Testees Who Strive for Perfection Achieve Better Test Results

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Abstract

Positive conceptions of perfectionism (Stoeber & Otto, 2006) suggest that perfectionistic strivings may form part of a healthy pursuit of excellence and are associated with higher academic achievement and higher performance in laboratory tasks. To extend such research findings, the present study explores if perfectionistic strivings also predict aptitude test performance, while controlling for conscientious achievement striving. A sample of 111 participants, who completed measures of perfectionistic strivings and conscientious achievement striving, were given a set of aptitude tests comprising reasoning, speed, and work sample tests. Results showed that, while conscientious achievement striving was unrelated to performance in all tests, perfectionistic strivings predicted higher performance in both reasoning tests and work sample tests. Apart from providing further support for the view that perfectionistic strivings are a positive personality characteristic, the findings may also have relevance for applied psychology, as they suggest that testees who strive for perfection may achieve better results in aptitude tests which are routinely used in personnel selection and assessment.

Keywords: ability tests; speed; reasoning; work samples; intelligence; conscientiousness; achievement striving

Author Note

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Introduction

In layman's terms, perfectionism can be described as the disposition to regard anything short of perfection as unacceptable, with perfection defined as flawlessness or an unsurpassable degree of accuracy or excellence (Merriam-Webster, 2006). In the scientific study of perfectionism, however, two forms of perfectionism have been differentiated: a positive form of perfectionism, which has also been called normal, healthy, functional, or adaptive perfectionism; and a negative form of perfectionism, which has also been called neurotic, unhealthy, dysfunctional, or maladaptive perfectionism (Hamachek, 1978; Rice, Ashby, & Slaney, 1998; Rhéaume et al., 2000; Stumpf & Parker, 2000; Terry-Short, Owens, Slade, & Dewey, 1995). A recent review on the two different forms of perfectionism (Stoeber & Otto, 2006) shows that the negative form of perfectionism comprises those aspects of perfectionism that multidimensional conceptions of perfectionism have described as concern over mistakes (Frost, Marten, Lahart, & Rosenblate, 1990; Hill et al., 2004), socially prescribed perfectionism (Hewitt & Flett, 1991), or discrepancy between expectations and results (Slaney, Rice, Mobley, Trippi, & Ashby, 2001). In contrast, the positive form of perfectionism comprises those aspects of perfectionism that have been described as high personal standards (Frost et al., 1990; Slaney et al., 2001), self-oriented perfectionism (Hewitt & Flett, 1991), or striving for excellence (Hill et al., 2004). Following a suggestion by Frost, Heimberg, Holt, Mattia, and Neubauer (1993) who called the positive form of perfectionism "positive striving," but also stressing the perfectionistic character of these strivings, Stoeber and Otto (2006) called this dimension "perfectionistic strivings."

Regarding the character of perfectionistic strivings, a number of studies found that perfectionistic strivings showed positive correlations with a whole range of positive characteristics such as conscientiousness, extraversion, endurance, positive affect, satisfaction with life, active coping styles, and perceived ability to achieve (see Stoeber & Otto, 2006 for a comprehensive review). Moreover, perfectionistic strivings showed positive correlations with academic achievement: In medical students, perfectionistic strivings showed a positive correlation with self-reported medical school performance in the past academic year (Cox, Enns, & Clara, 2002; Enns, Cox, Sareen, & Freeman, 2001). In undergraduate students, those classified as adaptive perfectionists (high perfectionistic strivings and low perfectionistic concerns) showed a higher grade point average (GPA) than maladaptive perfectionists (high perfectionistic strivings and high perfectionistic concerns) and nonperfectionists (low perfectionistic strivings) (Grzegorek, Slaney, Franze, & Rice, 2004; Rice & Slaney, 2002). Also, in 12th grade high school students, high perfectionistic standards predicted GPA (Accordino, Accordino, & Slaney, 2000). Finally, regarding performance in a mid-term exam, undergraduate students with higher levels of perfectionistic strivings received higher grades than those with lower levels of perfectionistic strivings (Bieling, Israeli, Smith, & Antony, 2003). Taken together, the findings indicate that students who strive for perfection achieve a higher GPA than students who do not strive for perfection. Moreover, they achieve better exam results, which suggests that perfectionistic strivings may be positively correlated with performance in test situations.

Apart from studies looking at perfectionism and academic achievement, there are only two studies which have investigated the relationship between perfectionism and performance. In the first study (Slade, Newton, Butler, & Murphy, 1991), performance in a visual search task was investigated. In this task, participants were shown a series of random letter arrays on a computer display. They had to scan each array for a specific target letter and then press one of two keys, depending on whether they believed the target letter to be present or absent. When performance was examined in relation to a general

measure of perfectionism, results showed that perfectionism displayed a significant positive correlation with accuracy of task performance. In the second study (Kobori & Tanno, 2005), performance in a computerized version of the Stroop test was investigated. In this test, participants were given a series of color names presented in letters of a color that is different than the name of the color, and participants have to correctly identify the color of the letters (e.g., the word “blue” is presented in red letters, and the correct response is “red”). Moreover, participants completed selected subscales from the Multidimensional Perfectionism Cognition Inventory (Kobori & Tanno, 2004), which included a subscale measuring cognitions about personal standards. As personal standards have been shown to be a defining facet of the strivings dimension of perfectionism (Frost et al., 1993; Stoeber & Otto, 2006), this measure can serve as a proxy of perfectionistic strivings. When Stroop test performance was examined, personal standards showed a positive correlation with the number of correct answers, suggesting that perfectionistic strivings may also predict higher performance in test situations involving laboratory tasks.

The present study aimed to further examine the relationship between perfectionistic strivings and performance by exploring if perfectionistic strivings also predict higher performance in tests typically included in multiaptitude test batteries used for industrial and organizational assessment and personnel selection such as reasoning tests, speed tests, and work sample tests (Doverspike, Cober, & Arthur, 2004). Such an investigation would show two major additions to the existing literature on perfectionism and performance. First, by including verbal, numeric, and figural tests typically used to investigate faceted models of intelligence (Süß & Beauducel, 2005), it would provide the first investigation of whether the positive relationship between perfectionistic strivings and test performance generalizes across different task contents. Second, by including work sample tests, it would provide a first investigation into whether perfectionistic strivings also predict higher performance in tasks that are relevant for applied settings and predictive of job performance (Roth, Bobko, & McFarland, 2005).

Regarding personality and performance, conscientiousness is a personality characteristic that has demonstrated to be predictive of job performance (Barrick, Mount, & Judge, 2001). Moreover, conscientiousness has been shown to be related to perfectionistic strivings (e.g., Enns et al., 2001; Stumpf & Parker, 2000). Consequently, it would be important to control for conscientiousness when examining the relationship between perfectionistic strivings and performance in the work sample tests, particularly as researchers, who are critical of positive conceptions of perfectionism, have urged researchers to differentiate between perfectionistic strivings and high levels of conscientiousness when investigating positive effects of perfectionism (e.g., Flett & Hewitt, 2006). However, like perfectionism, conscientiousness is a multifaceted trait. According to Costa and McCrae (1992), six facets can be differentiated: competence, order, dutifulness, achievement striving, self-discipline, and deliberation. Regarding how these six facets are related to perfectionism, two studies found that self-oriented perfectionism and personal standards—which both represent defining facets of perfectionistic strivings (Stoeber & Otto, 2006)—have shown the highest correlations with the achievement striving facet of conscientiousness (Dunkley, Blankstein, Zuroff, Lecce, & Hui, 2006; Hill, McIntire, & Bacharach, 1997). As the achievement striving facet of conscientiousness has also shown high predictive validity for task performance (e.g., Dudley, Orvis, Lebiecki, & Cortina, 2006), we included conscientious achievement striving in the present study as a control variable when investigating the relationship between perfectionistic strivings and performance in aptitude tests. In line with the previous research findings that show perfectionistic strivings to be associated with higher academic achievement (GPA, exam performance) and higher performance in labo-

ratory tasks (visual search task, Stroop test), we expected that perfectionistic strivings would also predict higher performance in aptitude tests.

Method

Participants and Procedure

A sample of $N = 111$ participants (53 male, 58 female) was recruited at the Technical University of Rhineland-Westphalia (Rheinisch-Westfälische Technische Hochschule, RWTH) and at different job centres in Aachen, Germany for a study advertised as an opportunity to gain experience with aptitude tests as typically employed in personnel selection. Mean age was 23.6 years ($SD = 3.4$; range: 18-35 years). Participants were tested in groups of up to 12 participants. All participants received €20 (approximately US\$25) in compensation for participation and had the opportunity to receive individual feedback on their performance.

Measures

Overview

The study included ten measures: a measure of perfectionistic strivings and a measure of conscientious achievement striving (serving as predictor variables) and eight aptitude tests that formed part of a multiaptitude test battery as typically administered in personnel selection (serving as criterion variables).

Perfectionistic Strivings

To measure perfectionistic strivings, an adapted version of the striving for perfection scale of the Multidimensional Inventory of Perfectionism in Sport (Stöber, Otto, & Stoll, 2004) was employed comprising eight items (see Appendix). While originally developed to capture perfectionistic strivings in athletes, adaptations of the scales have been successfully employed to measure perfectionistic strivings in school students (Stoeber & Rambow, 2005) and school teachers (Stoeber & Rennert, 2005). Moreover, in a large undergraduate student sample (Stoeber, 2005), the scale has demonstrated high convergent correlations with self-oriented perfectionism ($r = .88$) and personal standards ($r = .75$), both of which are established measures of perfectionism and represent defining facets of perfectionistic strivings (see Stoeber & Otto, 2006). For the present sample, instructions were modified to specifically measure perfectionistic strivings in test situations by asking participants to indicate how they usually approached test situations (tests, written exams, oral exams). Items were answered on a 6-point scale from “never” to “always.” With a Cronbach’s alpha of .93, the measure showed high reliability.

Conscientious Achievement Striving

To measure conscientious achievement striving, the achievement striving scale of the revised NEO Personality Inventory Conscientiousness facet scales (Costa & McCrae, 1992; German version: Ostendorf & Angleitner, 2004) was employed. The scale comprises eight items (e.g., “I strive to achieve all I can”), and participants respond on a 5-point scale from “strong disagreement” to “strong agreement.” With an alpha of .73, the measure showed acceptable reliability.

Test Performance

Reasoning. Participants were given three reasoning tests: a verbal, a numeric, and a figural reasoning test. The verbal reasoning test was the analogies (Analogien) subtest of the revised Wilde Intelligence Test (WIT-2, Kersting, Althoff, & Jäger, in press). It com-

prises 20 incomplete analogies (e.g., sheep : wool = bird : ?), and testees are given 4 minutes 30 seconds to complete the analogies by choosing the correct word from five alternatives (here: feathers). The numeric reasoning test was the number sequences (Zahlenreihen) subtest of the WIT-2. It comprises 20 incomplete number sequences (e.g., 7, 21, 18, 9, 27, 24, 12, ?), and testees are given 10 minutes to complete all sequences by writing down the next number in the logic of the sequence (here: 36). The figural reasoning test was the folding (Abwicklungen) subtest of the WIT-2. It comprises 20 figural patterns that, when mentally folded along the cut lines, result in three-dimensional objects (e.g., a cube or a pyramid). Testees are given 9 minutes to select for each figural pattern among five alternatives the object that would result from folding the pattern. With Cronbach's alphas of .85 (verbal reasoning), .89 (numeric reasoning), and .88 (figural reasoning), all tests showed satisfactory reliabilities.

Speed. Participants were given three speed tests: a verbal, a numeric, and a figural speed test. The verbal speed test was the part-whole (Teil-Ganzes) subtest of the Berlin Intelligence Structure Test, Version 4 (BIS-4; Jäger, Süß, & Beauducel, 1997). It comprises a list of 80 words (e.g., rose, leaf, sea, army, soldier, egg, etc.), and testees have 2 minutes to cross out all words that have a part-whole relationship with the immediately preceding word (here: leaf, soldier). The numeric speed test was the x greater (X Größer) subtest of the BIS-4. It comprises a list of 130 numbers in sequence (e.g., 18, 20, 24, 27, 2, 5, etc.), and testees have 1 minute 30 seconds to cross out all numbers that are 3 greater than the immediately preceding number (here: 27 and 5). The figural speed test was the letter cross-out (Buchstaben-Durchstreichen) subtest of the BIS-4. It comprises a list of 800 letters in direct sequence (e.g., sjdixldiejnwlöxvkd etc.), and testees have 1 minute 10 seconds to cross-out all letters "x." In all three speed tests, testees are instructed to work as fast as they can. For each test, only the total number of correct responses is recorded. Consequently, test scores represent single items (Jäger et al., 1997) and Cronbach's alphas cannot be computed.

Works samples. Participants were given two work sample tests. The first was the sorting letters (Kundenbriefe Sortieren) subtest of the revised General Office-Work Test (Lienert & Schuler, 1994). It comprises 36 letters from customers, each containing three pieces of information: name of customer, business, date of correspondence (e.g., Zimmermann, Exotic Fruits, September 24th). Testees are given 6 minutes to sort the letters according to name (forty categories), business (three categories), and date (four categories) by writing down the correct sort code for each letter. The second work sample test was the processing emails (Emails Bearbeiten) subtest of the WIT-2 (Kersting et al., in press). This test is a modern version of the classic in-basket test (Frederiksen, Saunders, & Wand, 1957) and measures the ability to differentiate relevant from irrelevant information and process correspondence accordingly. The test comprises 42 short emails to be processed according to recipient, urgency, content, and sender (each with two categories). Following a specified set of rules combining the above information, testees have 8 minutes 30 seconds to decide how to process each email choosing from six alternatives (answer, forward, or save as internal or external mail). With Cronbach's alphas of .92 (sorting letters) and .95 (processing emails), both tests showed high reliability.

Preliminary Analyses

Following procedures recommended by Tabachnick and Fidell (2007, pp. 99-104), data were screened for multivariate outliers by regressing cases on perfectionistic strivings, conscientious achievement striving, and the eight individual test scores. Results showed one significant multivariate outlier (Mahalanobis distance significant at $p < .001$), namely a participant with a score of 107 in the figural speed test (letter cross-out). As this score

was five standard deviations higher than the sample's mean score, the participant was deleted from the further analyses.

Results

In correspondence with our expectation of positive correlations between perfectionistic strivings, conscientious achievement striving, and test performance, all correlations were tested with directional tests. Consequently, p values are one-tailed unless indicated otherwise. First, the correlation of perfectionistic strivings and conscientious achievement striving was inspected. In line with previous findings (Dunkley et al., 2006; Hill et al., 1997), perfectionistic strivings showed a substantial positive correlation with conscientious achievement striving, $r = .46, p < .001$.

Next, the zero-order correlations of perfectionistic strivings and conscientious achievement striving with test performance were inspected (see Table 1). Regarding reasoning test performance, perfectionistic strivings predicted performance in all three tests as well as total reasoning test performance. In contrast, conscientious achievement striving did not predict reasoning test performance. Regarding the performance in the speed tests, perfectionistic strivings predicted test performance in the verbal speed test (part-whole), but not in the other speed tests. Consequently, it did not predict total speed test performance. Neither did conscientious achievement striving which was unrelated to performance in any of the speed tests. Regarding the two work sample tests, perfectionistic strivings predicted performance in both tests as well as total work sample test performance. Moreover, with $r = .32$, the correlation with total work sample test performance was above .30 and thus represented a medium-sized correlation following common conventions (Cohen, 1988). In contrast, conscientious achievement striving did not predict work sample test performance. Consequently, when partial correlations were computed to control for the overlap between perfectionistic strivings and conscientious achievement striving (Table 1), the partial correlations of perfectionistic strivings were only slightly attenuated. Moreover, all relationships that were significant when zero-order correlations were regarded remained significant when partial correlations were regarded, except for the one with the figural reasoning test (unfolding) which now was only marginally significant. In contrast, all relationships between conscientious achievement striving and test performance were reduced to values near zero, once perfectionistic strivings were partialled out.

Finally, we examined whether perfectionistic strivings would also predict performance in the work sample tests after the influence of performance in reasoning and speed tests was taken into account. Previous studies have shown that performance in work sample tests is a joint function of individual differences in processing speed, as captured in speed tests, and processing capacity, as captured in reasoning tests (Lienert & Schuler, 1994; see also Roth et al., 2005). Consequently, a hierarchical regression analysis was computed with total work sample test performance as the criterion variable. Total reasoning test performance and total speed test performance were entered as predictor variables in Step 1, and perfectionistic strivings and conscientious achievement striving were entered as further predictor variables in Step 2 (see Table 2). In line with previous findings, both reasoning test performance and speed test performance predicted performance in the work sample tests. Moreover, when perfectionistic strivings and conscientious achievement striving were added to the regression, this added significantly to the overall prediction of work sample test performance. However, only perfectionistic strivings contributed significantly to the prediction of work sample performance, but not conscientious achievement striving. Thus, independently of individual differences in reasoning ability, speed, and conscientious achievement striving, individual differences in perfectionistic strivings predicted higher performance in work sample tests, suggesting that

the present measure of perfectionistic strivings has low criterion-related validity in predicting work sample performance above and beyond reasoning and speed.

Discussion

The aim of the present research was to investigate further the relationship between perfectionism and performance by examining how perfectionistic strivings relate to performance in reasoning, speed, and work sample tests while controlling for conscientious achievement striving. In line with previous findings that perfectionistic strivings are associated with higher academic achievement and higher performance in laboratory tasks, results showed that perfectionistic strivings predicted higher performance in both reasoning tests and work sample tests, whereas achievement striving was unrelated to performance in any of the aptitude tests administered. Moreover, perfectionistic strivings predicted performance in work sample tests above and beyond individual differences in reasoning abilities, speed, and conscientious achievement striving. Thus, the findings indicate that perfectionistic strivings is not only related to higher academic achievement and higher performance laboratory tasks, but also may predict higher performance in aptitude tests as they are typically used in industrial and organizational assessment and personnel selection, particularly in predicting work sample performance.

The present study has some limitations, however. First, it represents the first investigation of perfectionism and aptitude test performance, employing a new measure of perfectionistic strivings and a set of aptitude tests typically used in German speaking countries. Consequently, future studies will have to show that the present findings can be replicated with other, more established measures of perfectionistic strivings and with aptitude tests typically used in English speaking countries. Second, future studies need to investigate how perfectionistic strivings exert a positive influence on aptitude test performance. In this, achievement goals may play a mediating role (cf. Elliot, McGregor, & Gable, 1999). A recent study on perfectionism and achievement goals (Stoeber, Stoll, Pescheck, & Otto, submitted) found that perfectionistic strivings were associated with both mastery-approach and performance-approach achievement goals. As mastery-approach goals have been shown to predict intrinsic task motivation and performance-approach goals to predict task performance in educational settings (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002), approach achievement goals may also have positive effects in settings where aptitude tests are applied. Consequently, future studies on perfectionism and aptitude test performance should also include measures of achievement goals.

Notwithstanding these limitations, the present findings may have important implications. First, they indicate that testees who strive for perfection may achieve better tests results and thus have a greater chance to be interviewed and selected when applying for jobs where results from aptitude tests are part of the selection process. Consequently, perfectionistic strivings represent a personality characteristic which may be of potential interest for industrial and organizational assessment and personnel selection. Second, the findings provide further support for the position that perfectionistic strivings can be regarded as a positive characteristic, as they show reliable and consistent relationships with positive characteristics and adaptive outcomes (Stoeber & Otto, 2006). Thus, not all aspects of perfectionism are neurotic, unhealthy, or maladaptive. On the contrary, perfectionistic strivings may form part of a healthy pursuit of excellence and could be adaptive in test and exam situations where such strivings may give individuals an additional motivational "boost" to do their best and thus achieve better test results.

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Table 1

Striving for Perfection, Conscientious Achievement Striving, and Aptitude Test Performance: Correlations

Performance	Zero-order correlation		Partial correlation	
	Perfectionistic strivings	Conscientious achievement striving	Perfectionistic strivings	Conscientious achievement striving
Reasoning test				
1. Verbal	.20*	.10	.17*	.01
2. Numeric	.18*	.07	.17*	-.02
3. Figural	.21*	.15	.16 ⁺	.07
Total reasoning	.25**	.13	.21*	.02
Speed test				
1. Verbal	.18*	.07	.17*	-.01
2. Numeric	.03	.05	.01	.04
3. Figural	.05	.07	.03	.05
Total speed	.12	.08	.09	.03
Work sample test				
1. Sorting letters	.27**	.12	.25**	.00
2. Processing emails	.28**	.11	.26**	-.02
Total work sample	.32***	.13	.29**	-.01

Note. $N = 110$. Total reasoning, total speed, and total work sample performance = sum of standardized subtest scores.

⁺ $p = .05$, * $p < .05$, ** $p < .01$, *** $p < .001$, one-tailed.

Table 2

Summary of Hierarchical Regression Analyses Predicting Total Work Sample Test Performance

Variable	<i>B</i>	<i>SE B</i>	β
Step 1			
Total reasoning	.52	.09	.47***
Total speed	.36	.10	.31***
Step 2			
Total reasoning	.47	.09	.42***
Total speed	.37	.09	.32***
Perfectionistic strivings	.13	.05	.19**
Conscientious achievement striving	-.01	.02	-.04

Note. $N = 110$. Step 1: $R^2 = .474$, $p < .001$, two-tailed; Step 2: $\Delta R^2 = .030$, $p < .05$, two-tailed. Else, see Table 1.

** $p < .01$, *** $p < .001$, one-tailed.

Appendix

Striving for Perfection Scale (Stöber et al., 2004), Adapted: Items

- I strive to be as perfect as possible
- It is important to me to be perfect in everything I attempt
- I feel the need to be perfect
- I have the wish to do everything perfectly
- I am a perfectionist as far as my targets are concerned
- I have extremely high expectations of myself
- I want to do everything perfectly
- I demand nothing less than perfection of myself