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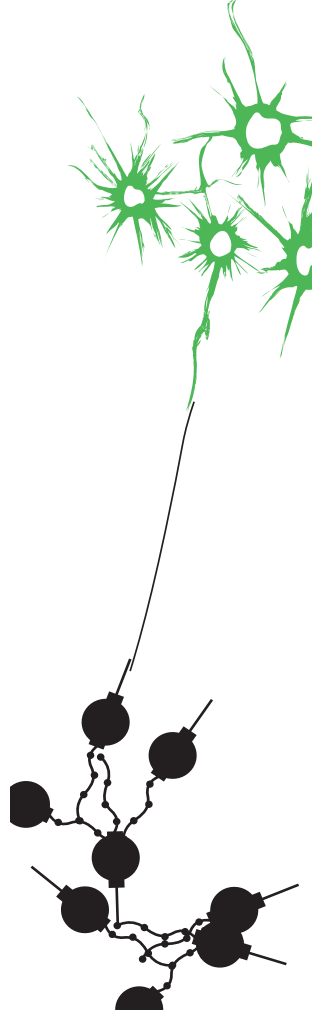
Faculty of Behavioural, Management & Social Sciences

**Bachelor Thesis**

## **The Relationship between Person- Environment fit, Grit and Task performance: A mediation analysis**

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### **Abstract**

*Background:* The global economy of the 21<sup>st</sup> century requires the enhancement of employee performance more than ever. Two factors, which have been identified as predictors of work-related performance, were combined into a conceptual model in this study. Person-Environment fit (P-E fit) theory states that the alignment between individuals' characteristics and environmental aspects result in the enhancement of performance. The personality trait grit, which is defined as the ability to achieve performance with a high amount of stamina, has been identified as a predictor of performance more recently. *Objective:* The aim of this study was to investigate whether grit mediates the relationship between P-E fit and performance. Additionally, was the aim to gain a deeper understanding whether grit can be influenced by third variables, which also predict performance, i.e. P-E fit. Therefore P-E fit and grit were combined as important predictors of task performance in this study. *Method:* In a cross-sectional study, the associative relationship between P-E fit, grit and task performance was examined. A sample of 153 employed participants, gathered by means of convenience sampling, completed a survey pertaining to their perceived P-E fit-, grit- and task performance-level. *Results:* The results indicated a statistically significant positive relationship between P-E fit, grit, and task performance. Stepwise multiple regression analyses revealed that P-E fit as well as grit predicted employees' task performance level. Furthermore, was grit found to be a significant mediator in the relationship between P-E fit and task performance. *Conclusion:* The results provide support for grit as predictor of performance and showed that grit can be influenced indeed. Grit explained, as a mediator, the underlying process through which P-E fit is associated with performance. Practical implications imply that interventions, which aim at increasing P-E fit, might be beneficial for the employee in order to deal with challenging work environments. It seems that by means of a good P-E fit, employees can make use of their grit more easily in order to achieve performance.

*Keywords:* Person-environment fit, grit, task performance, mediation, personal resources, job resources, JD-R model

## Introduction

One of the most important questions for organizations is how to make employees perform high (Eggerth, 2008). With regard to the global economy of the 21<sup>st</sup> century, organizations have to cope with rapid changes and increasing challenges (Cesário & Chambel, 2017; Sonnentag, 2002). In order to maintain competitive advantage, the enhancement of employee performance is required more than ever. As such, researchers are, despite years of research, still concerned with the identification of the various attributing factors to work-related performance (Koopmans et al., 2011).

Organizational factors have been identified as fundamental attributes of employee performance (Sonnentag, 2002). A positive relationship exists between the working climate (Parker et al., 2003) or the perceived organizational support (Kurtessis et al., 2015) and employees' performance. From this perspective, the organization as a whole provides supportive working conditions in order to offer an environment in which employees are able to perform high (Kurtessis et al., 2015). As such exerts the working environment always influence on employees' behavior. Evidence specifically suggests that the alignment between characteristics of the work environment and employees' characteristics, referred to as Person-Environment fit (P-E fit), results in a prospering individual, showing greater performance (Milliman, Gatling, & Bradley-Geist, 2017; Oh et al., 2014).

Findings revealed that P-E fit has significantly positive effects on various individual, e.g. engagement, job satisfaction, task performance, and organizational outcomes, e.g. team engagement, psychological ownership, fiscal performance (Han, Chiang, McConville, & Chiang, 2015; Hardin & Donaldson, 2014; Lauver & Kristof-Brown, 2001; Kristof-Brown, Zimmerman, & Johnson, 2005). Specifically, higher perceived fit results in a higher level of employees' performance (Kulik, Oldham, & Hackman, 1987; Milliman et al., 2017). However, although the P-E fit – outcome relationship has been studied to a great extent, little is known about the underlying mechanisms through which P-E fit leads to employee performance (Greguras & Diefendorff, 2009). Previous studies indicated the need to examine the role of personal factors in the relationship between P-E fit and performance (Kristof-Brown et al., 2005).

A lot of research revealed that individual factors such as the individual's general cognitive ability shows a strong relationship with work performance (Schmidt, 2002). Organizations rely on individuals' skills and knowledge as determinants for performance (Sonnentag, 2002). An organization may not function on a high-performance level whenever the separate individuals are not accomplishing the prescribed tasks (Chen, Kirkman, Kanfer,

Allen, & Rosen, 2007). Following this argumentation, employees hold the control of those actions resulting in the overall goals of organizations (Rotundo & Sackett, 2002), which make individual factors crucial in predicting employee performance.

Especially personality traits determine the amount of time and effort an individual puts into a specific task or action (Bipp, 2009). Supporting this argumentation a growing number of studies revealed the personality trait grit as predictor of performance (Credé, Tynan, & Harms, 2017; Suzuki, Tamesue, Asahi, & Ishikawa, 2015). Grit is briefly defined as the quality to sustain effort despite setbacks or failure by means of perseverance and interest over time (Duckworth, Peterson, Matthews, & Kelly, 2007; Eskreis-Winkler, Duckworth, Shulman, & Beal, 2014). Grit has been found to be important for task-related performance in various contexts such as journalism or investment banking (Duckworth et al., 2007). However, so far only two studies tried to provide insight into the predictive validity of grit in a broad occupational context and therefore more investigation in that field is needed (Ion, Mindu, & Gorbănescu, 2017; Suzuki et al., 2015). In addition to that, so far it is not clear whether third variables, which also predict performance, have an influence on grit. As Duckworth et al. (2007) point out it is possible that the capability to generate grit is specified by those variables. As a result, certain preconditions would be necessary in order for individuals to generate grit.

Although P-E fit and grit are shown to be important factors relating to performance in various contexts, little is known as to how these factors together account for the enhancement of performance. Taken together, it could be assumed that the personal characteristic grit can help to explain the mechanism through which P-E fit leads to performance. Thereby the level of the perceived P-E fit of the employee would possibly a prerequisite for generating grit. The purpose of this study is therefore to determine the relationship between P-E fit, grit, and performance (i.e. task performance) within the occupational context. In the next section, P-E fit, grit, task performance and the associative relationships between these variables will be defined and discussed.

### ***Person-environment fit***

The basic principle of person-environment fit (P-E fit) is based on Lewin's Field Theory, which states that an individual's behavior is a result of the interaction between individual and environment (Oh et al., 2014; Milliman et al., 2017). P-E fit is considered a multi-dimensional construct, which refers to "the degree of compatibility or match between individuals and some aspect of their work environment" (as cited in Oh et al., 2014, p. 100; Kristof-Brown et al., 2005; Milliman et al., 2017). Theory of P-E fit became a major field of research, resulting in various frameworks and conceptualizations. The general assumption is that individuals are able to overcome environmental obstacles provided that the person perceives a good fit in the first place (Binning, LeBreton, & Adorno, 2006).

In the past, especially three dimensions have received much attention in the literature: Person-Job fit (P-J fit), Person-Organization fit (P-O fit) and Needs-Supplies fit (N-S fit) (Lauver & Kristof-Brown, 2001; Cable & DeRue, 2002; Hinkle & Choi, 2009). The first, P-J fit, refers to the alignment between a person's skills and the characteristics of the job or task at hand (Erhart & Makransky, 2007; Jansen & Kristof-Brown, 2006). The second, P-O fit, emphasizes the congruence between the values of an individual and the overall culture of the organization (Cable & DeRue, 2002; Hinkle & Choi, 2009; Lauver & Kristof-Brown, 2001). N-S fit represents the fit between a person's needs and the supplies the organization provides in terms of rewards (Cable & DeRue, 2002).

Generally, findings report that higher fit perceptions result in positive outcomes for the employee as well as for the organization (Oh et al., 2014). P-E fit significantly increases job satisfaction, organizational commitment (Milliman et al., 2017), positive work attitudes, and the intention to stay (Oh et al., 2014). Most important for the present study, a good perceived fit is a predictor of job performance (Gregory, Albritton, & Osmonbekov, 2010). However, only a few studies made the attempt to explain the underlying processes through which P-E fit leads to performance (Greguras & Diefendorff, 2009). More research is needed to get a comprehensive picture why individuals who perceive a good fit with the work environment perform better (Gregory et al., 2010).

### ***Grit***

Grit is an emerging concept in the field of positive psychology and deals with the question why some people perform better than others with equal intelligence (Duckworth et al., 2007). It is a personal quality, which refers to the ability to achieve long-term goals despite setbacks, challenges or the presence of negative feedback (Duckworth & Gross, 2014). Gritty individuals maintain perseverance as well as interest over a long period of time

(Duckworth et al., 2007). This entails the individual to achieve success because the focus is not shifted to different goals when failure or boredom is experienced. The construct consists of two related but distinct facets: perseverance of effort and consistency of interest (VonCulin, Tsukayama, & Duckworth, 2014; Muenks, Wigfield, Yang, & O'Neal, 2017).

The first, perseverance of effort, points to the importance of being ambitious for a certain amount of time in order to achieve high performance. During the process of achievement, setbacks are naturally included. By means of perseverance of effort, the individual endures the experienced setbacks (Duckworth et al., 2007). Gritty individuals realize that setbacks do not necessarily impede long-term goals. The latter, consistency of interest, is important because individuals need to maintain interest for a long period of time in order to attain higher order goals. When goals are changed frequently, mastery cannot be achieved which in turn hinders the accomplishment of high performance (Credé et al., 2017). Duckworth et al. (2007) argue that none of the two facets bear the ultimate prediction to a greater extent but that the facets together account for the outcomes.

Several studies have been conducted to reveal the relationship of grit and positive human functioning facets. Vainio and Daukantaitė (2016) examined grit and its relation to different well-being factors (psychological well-being, satisfaction with life and harmony in life). Results showed a relationship between grit and all well-being factors, mediated by sense of coherence and authenticity. Research also revealed a positive relationship between grit and positive affect (Hill, Burrow, & Bronk, 2016), autonomy, competence needs and orientation towards –engagement, -meaning, and –pleasure (Jin & Kim, 2017; VonCulin et al., 2014).

Grit emerged originally from the academic and work context. Duckworth et al. (2007) found that grit is a stable and significant predictor of achievement and success across different domains, including undergraduates' grade point average, West Point cadets' retention, spelling bees' performances (Jin & Kim, 2017; Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011) and teacher effectiveness (as cited in Eskreis-Winkler et al., 2014). While grit has been found to predict individuals' performances across different occupations (Duckworth et al., 2007), attention has been primarily paid to specific work domains, for example West Point cadets or teachers. Only two studies conducted research in a comprehensive sample. Ion et al. (2017) put the impact of grit in the workplace into question and called for further research. Contrary, a study conducted in Japan showed that grit was a strong predictor of work performance in a broad business sample (Suzuki et al., 2015). Based on these inconsistencies and the fact that grit is still a quite new construct, the need to further examine the grit-performance relationship in the occupational context becomes clear.

In addition to that, it is still not evident whether grit is a stable personality trait or can be rather seen as a personal quality. Although Duckworth et al. (2007) argue that grit is relatively stable, the terms ‘personal quality’ and ‘personality trait’ are used interchangeably. According to the classical personality development theory, traits evolve during childhood and then remain stable when individuals reach the adulthood (Roberts, Walton, & Viechtbauer, 2006). If grit were a stable personality trait indeed, it would imply that the level of grit could not be influenced easily in adulthood. Contrary, if grit is a personal quality that can be influenced to a greater extent, the question arises which circumstances or preconditions are necessary for individuals for generating grit. Taken together, more investigation is needed whether grit can be influenced by other variables at all and whether certain preconditions need to be present in order that individuals avail their selves of grit (Duckworth et al., 2007).

### ***Task performance***

Individual work performance is a multidimensional concept often defined as “behaviors or actions that are relevant to the goals of the organization” (Koopmans et al., 2011, p. 28; Sonnentag, 2002). Within organizational psychology individual performance is one of the fundamental outcomes that organizations try to predict (Sonnentag, 2002). As such, various approaches to performance exist, like work-generic vs. work-specific or self-ratings vs. supervisor ratings (Hoffman, Nathan, & Holden, 1991). More recently, Koopmans et al. (2011) developed a heuristic framework of individual work performance consisting of four dimensions: Counterproductive work behavior, adaptive performance, contextual performance and task performance.

Especially the last dimension, task performance, seems to be the most important indicator regarding employees’ performance (Koopmans et al., 2013). Different conceptualizations of performance all include activities, which cover the execution of the required job tasks (Rotundo & Sackett, 2002). It is argued that task performance is the driving dimension that contributes to the organization’s overall effectiveness. The present study will, therefore, focus on task performance. Task performance refers to the technical core of ones work and the proficiency with which individuals perform the tasks at hand (Motowidlo & VanScotter, 1994; Rotundo & Sackett, 2002; Sonnentag, 2002).

It is worth noting that task performance is of importance for the organization as well as for the employee. On the one hand, employees might feel pride and perceive higher job satisfaction by achieving the prescribed tasks (Edwards, Bell, Arthur, & Decuir, 2008; Sonnentag, 2002). Variance in positive work-related outcomes for the employee such as career advancement is explained by task performance (VanScotter, Motowidlo, & Cross,



2000). On the other hand, managers rated task performance as most important in overall work performance, thus indicating that especially task performance contributes to the overall performance of the organization (Rotundo & Sackett, 2002).

In the past, research has identified several cognitive as well as non-cognitive antecedents for task performance in different work contexts. Many studies showed that general mental ability is a good predictor of task performance (Sonnentag, 2002; Schmidt & Hunter, 2004). Referring to non-cognitive variables especially conscientiousness was found to be predictive for differences in employees' task performance level (Kamdar & VanDyne, 2007).

Other traits, for example grit, have not been examined as possible predictors of task performance across a broad diversity of working fields. Grit might be associated with task performance because gritty individuals are able to place the completion of a task at hand within a broader relation to long-term goals. Because task performance is a behavioral outcome, it is necessary to take into account what makes individuals behave the way they do. Based on the premise mentioned before that an individual's behavior is the result of interaction between individual and environment, especially P-E fit perceptions might be an important antecedent for task performance. The associative relationship of the three variables P-E fit, grit, and task performance will be discussed in the following.

### ***The relationship between P-E fit, grit and task performance***

This study will examine the relationship between the three above reviewed constructs based on the inconsistencies and gaps that still exist in the literature. To the author's knowledge, no study combined P-E fit and grit as important predictors of task performance. In order to explain the underlying process through which P-E fit contributes to task performance and to examine thereby whether P-E fit is a possible precondition for generating grit, the two constructs will be combined in this study.

P-E fit perceptions help to understand the employees' behavior. This also includes the performance of a task at hand. P-E fit is important as an attribute for task performance because the environment in which the individual performs the task maintains a considerable amount of influence on the execution (Law et al., 1996). Likewise, it is hypothesized that fit perceptions have an influence on employees' level of grit. A high level of fit might offer a foundation in which the individual can operate easier with perseverance and consistency in order to achieve task performance.

Based on grit's definition that tasks will be executed by means of perseverance and consistency although its' perceived difficulty or setbacks, gritty employees should score high

on task performance. Although grit emphasizes the achievement of long-term goals (Duckworth et al., 2007), the actual long-term goals are framed by the separate tasks that lead to the superior goal (Duckworth & Gross, 2014). Additionally, given that task performance refers to the proficiency with which individuals perform the tasks at hand, grit complements task performance by the proposition that mastery can only be achieved by years of consistency and persistence.

The Job Demands-Resources Model (JD-R model) can be applied for the explanation of employee performance and offers a framework to clarify the assumed relationship between P-E fit, grit and task performance. According to this model, organizational aspects can be either grouped into job demands (e.g. mental or physical effort) or job resources (e.g. autonomy or feedback) (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Bakker & Demerouti, 2007). Job resources are defined as factors that encourage personal growth and/or result in the achievement of goals at work (Bakker & Demerouti, 2007). Based on the notion that individuals are integrated into the working environment as a whole (Jansen & Kristof-Brown, 2006) and the need for more general job resources (Bakker & Demerouti, 2007), it is assumed that perceived P-E fit can be seen as a job resource relevant for several occupations.

Xanthopoulou, Bakker, Demerouti, and Schaufeli (2007) explain the importance of personal resources within the JD-R model. Personal resources are described as the individuals' perceived ability to deal with the environment especially while experiencing challenging conditions (Xanthopoulou et al., 2007). Grit has been described as an adaptive resource to the individual in previous studies (Hill et al., 2016). As such it is argued that grit can be treated as a personal resource defined by the JD-R model. Personal resources were found to mediate the relationship between job resources and work engagement (Xanthopoulou et al., 2007). Therefore, it is presumed that grit could act as a potential mediator between the relationship of P-E fit and task performance. Taken together, in the view of the JD-R model, P-E fit will be treated as a job resource and antecedent for grit. Grit, in turn, is seen as personal resource and mediator through which P-E fit leads to task performance.

Based on the need to elaborate the underlying mechanisms of the P-E fit – performance relationship and the need to examine whether preconditions for generating grit exist, the purpose of this study is to test the assumed relationship between P-E fit, grit and task performance. Especially, the study aims at identifying grit as the potential mediator in this relationship. All hypotheses of the present study are listed below.

### Study hypotheses

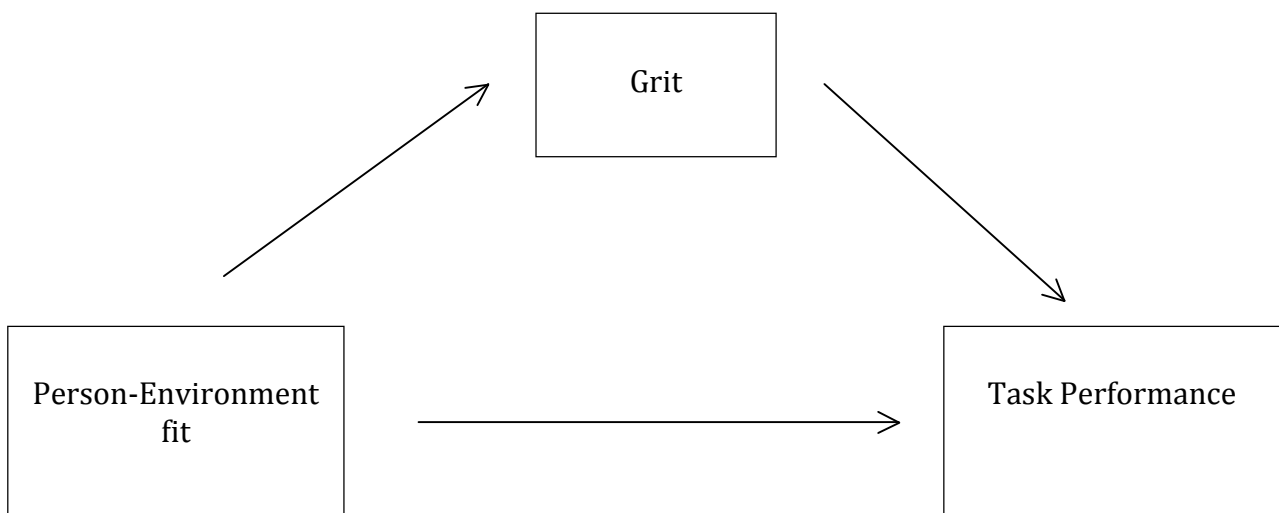
Based on the problem statement and literature review, the following research hypotheses were established and formulated into a conceptual model (Fig. 1).

H<sub>1</sub>: There is a statistically significant positive relationship between person-environment fit, grit and task performance.

H<sub>2a</sub>: Person-environment fit and grit predict task performance.

H<sub>2b</sub>: Person-environment fit predicts grit.

H<sub>3</sub>: Grit mediates the relationship between person-environment fit and task performance.



*Figure 1.* Hypothesized model for the relationship between Perceived Person-Environment fit, Grit and Task Performance.

## Method

### *Design*

By using a quantitative cross-sectional survey-based design the relationship between P-E fit, grit and task performance was investigated. This research design is beneficial because it can be implemented with little resources and may provide substantial data within a short time (Kelley, Clark, Brown, & Sitzia, 2003). In order to gather respondents, a convenience sampling was implemented. A compilation of several standardized questionnaires or subscales were used to obtain the data, which will be described below.

### *Participants*

A convenience sample ( $n = 153$ ) was gathered to test for the established hypotheses. The participants were required to speak, write, and understand English fluently, to be at least 18 years old and to be employed.

Table 1 provides some socio-demographic characteristics of the respondents. The sample was composed of 63.4% female respondents ( $n = 97$ ) and 36.6% male respondents ( $n = 56$ ). The age ranged from 19 to 65 years of age ( $M = 37.62$ ;  $SD = 12.29$ ). Most of the participants were German ( $n = 86$ ), followed by South African ( $n = 49$ ) and Others ( $n = 15$ ). A total of 129 (84.3%) of the participants held a full-time job, whereas only 24 (15.7%) were employed part-time.

Table 1

*Socio-demographic characteristics of the participants (N = 153).*

<i>Item</i>	<i>Category</i>	<i>Frequency</i>	<i>Percentage</i>
Gender	Female	97	63.4
	Male	56	36.6
Age (years)	18-25	20	13.1
	26-35	65	42.5
	36-45	26	17.0
	46-55	20	13.1
	56-65	22	14.4
	Nationality	German	86
	South African	49	32.0
	Dutch	3	2.0
	Other	15	9.8
Employment status	Full-time	129	84.3
	Part-time	24	15.7

### ***Measuring instruments***

This study was executed in collaboration with two other researchers who were interested in different research questions. The following instruments were used to gather information pertaining to the research question of the present study: A demographic questionnaire, the Perceived Fit Scale, the 12-item Grit Scale, and one subscale of the Individual Work-Performance Questionnaire 3.0.

**Demographics.** A demographic questionnaire was used to gather information relating to respondents' gender, age, nationality, mother language, marital status, number of dependents, level of education, working hours, and English proficiency.

**Person-Environment fit (P-E fit).** The 'Perceived Fit Scale' (PFS) developed by Cable and DeRue (2002) was used to measure the perceived P-E fit level of the participants. The instrument consisted of nine items, composed of three subscales (P-O fit, P-J fit and N-S fit), which in turn are consisting of three statements. Responses are obtained on a seven-point Likert scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. The first subscale P-O fit uses items such as "The things I value in life are very similar to the things that my

organization values". The second subscale represents N-S fit with items like "There is a good fit between what my job offers me and what I am looking for in a job". Lastly, the P-J fit subscale with items such as "The match is very good between the demands of my job and my personal skills". The statements of the subscales were presented in random order. The overall level of P-E fit represents the extent to which employees rate their perceived fit with their work environment (Hinkle & Choi, 2009). The psychometric quality of the PFS suggests that it is an appropriate instrument with high levels of convergent as well as discriminant validity (Cable & DeRue, 2002). Hinkle and Choi (2009) reported even higher reliability coefficients ( $\alpha$  ranging from .94 to .98) than Cable and DeRue (2002) ( $\alpha$  ranging from .84 to .93). The overall PFS attained also in this study a high reliability coefficient with  $\alpha = 0.95$ .

**Grit.** The '12-item Grit Scale' developed by Duckworth et al. (2007) was used in order to measure the respondents' grit level. This questionnaire consists of a two-factor structure: Consistency of interest and Perseverance of effort. The two factors are framed by six statements respectively and are answered on a five-point Likert scale ranging from 1 = *Not like me at all* to 5 = *Very much like me*. Consistency of interest is measured with items such as "I have difficulty maintaining my focus on projects that take more than a few months to complete" (reversed). Perseverance of effort includes statements such as "I finish whatever I begin". High scores on the scale are an indication of a high grit level. Psychometrically, the grit scale can be rated as sufficient with an internal consistency up to  $\alpha = 0.85$  (Duckworth et al., 2007). The scale reached in this study a lower but acceptable reliability with  $\alpha = 0.78$  (Tavakol & Dennick, 2011).

**Task Performance.** One subscale of the 'Individual Work-Performance Questionnaire 0.3' (IWPQ) developed by Koopmans et al. (2014) was used to measure the employees' perceived task performance level. The original scale consists of 27 items, composed of four subscales: task performance, contextual performance, counterproductive work behavior, and adaptive performance. Based on the literature review only the subscale task performance was used. The subscale task performance consists out of seven statements each answered on a six-point Likert scale ranging from 1 = *Never* to 6 = *Always*. Respondents are asked to respond to the statements based on the last three months. An example of one statement is: "I managed to plan my work so that it was done on time". The Person Separation Index (PSI), which is similar to Cronbach's Alpha, of 0.82 for task performance indicates a high reliability (Koopmans et al., 2014). The alpha score in the present study for the task performance dimension was good with  $\alpha = 0.83$ .

### ***Procedure***

The ethical committee of the University of Twente approved the survey. Data collection took place between the 2<sup>nd</sup> of October and the 14<sup>th</sup> of November through the distribution of an electronic link. Participants were invited for the survey by means of e-mail and social media. Further participants were recruited via Sona System, an online subject pool software, which allowed the researcher to grant credits for students of the University of Twente. Prospective participants received an invitation letter including an explanation of the aim of the study and the link, which lead directly to the survey. Once participants clicked on the link the informed consent was displayed. Therein information was provided about the study content (i.e. the variables to be measured), estimated study duration (20-30 minutes), the chance to win one out of three 10 Euro Amazon vouchers, the possibility to withdraw at any time, participants' anonymity, and in case of questions, e-mail addresses of the researchers. The participants had to accept the informed consent for starting with the actual survey. After that several biographical questions were asked. Next, four standardized scales and one subscale were presented to measure different variables. In order to make chance for one of the Amazon vouchers, participants could fill in his or her e-mail address at the end of the survey. Finally, a notification informed the participants that they finished the survey and answers have been recorded. Because the research question of this study covers the occupational context, unemployed individuals and students were excluded from further analysis.

### ***Statistical analysis***

All statistical analyses were executed with the statistic program SPSS v24 (IBM 2016). The PROCESS macro for SPSS (Hayes, 2012) was used for linear regression models to determine whether grit was functioning as a mediator in the relationship between P-E fit and task performance. First of all, descriptive statistics were computed. For each variable (P-E fit, grit, and task performance) sum- and mean-scores, standard deviations, Skewness and Kurtosis were calculated. For Skewness as well as Kurtosis +1 and -1 were set as cut-off scores. Furthermore, for every variable, the Cronbach's Alpha coefficients were investigated. An Alpha value of  $\alpha > 0,70$  was assumed to be acceptable (Tavakol & Dennick, 2011).

Next, correlation analysis by means of Pearson's  $r$  was conducted to test for the relationship between the variables ( $H_1$ ). The level of statistical significance was set at  $p < 0.05$ . Regarding the strength of the relationships, it was assumed that 0.2 indicates a weak, 0.3 a moderate and 0.5 a strong correlation.

Thereafter, stepwise multiple regression analyses were computed to test whether P-E fit predicts grit as well as whether P-E fit and grit both predict task performance. In the first regression analysis, which aimed at testing hypothesis H<sub>2a</sub>, task performance was entered as dependent variable and P-E fit and grit were entered stepwise as independent variable. In the second regression analysis, which was executed for testing hypothesis H<sub>2b</sub>, grit was entered as dependent variable and P-E fit was entered as independent variable. In both analyses was age entered as a control variable.

Lastly, a mediation analysis was employed for testing hypothesis H<sub>3</sub> using the PROCESS macro in order to test whether grit mediates the relationship between P-E fit and task performance. PROCESS became a frequently used analysis tool. This macro approaches mediation by means of bootstrap confidence intervals, which makes it an advantageous method in the case of a non-normality of the sample distribution (Hayes, 2012). A statistical significant mediation is assumed when the confidence interval does not include zero.



## Results

### *Descriptive statistics, Reliability and Correlations*

Means and Standard Deviations were determined for the descriptive statistics (Table 2). The Cronbach's Alpha coefficients for the scales of this study were all acceptable, based on the general guideline for a Cronbach's Alpha value of  $\alpha > 0.70$  (Tavakol & Dennick, 2011). To test for normality of the scales, Skewness and Kurtosis were executed. Because the Skewness and Kurtosis scores of the scales lie between the interval of +1 and -1 they are interpreted as normally distributed.

In order to test for  $H_1$ , Pearson correlations were obtained. Table 2 shows that there was a moderate, positive and statistically significant correlation between P-E fit ( $M = 46.75$ ;  $SD = 10.37$ ) and grit ( $r = 0.34$ ;  $p = 0.00$ ). Perceived P-E fit was also weak but positive and statistically significant ( $r = 0.26$ ;  $p = 0.00$ ) related to task performance ( $M = 32.44$ ;  $SD = 5.13$ ). Finally, a moderate, positive and statistically significant relationship was found between grit ( $M = 43.08$ ;  $SD = 6.51$ ) and task performance ( $r = 0.38$ ;  $p = 0.00$ ). Taken together, the results of the correlation analysis confirmed the first hypothesis.

Table 2

*Descriptive statistics, Alpha coefficients and Correlations for the Scales.*

<i>Item</i>	<i>Mean</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i><math>\alpha</math></i>	<i>P-E fit</i>	<i>Grit</i>
P-E fit	46.75	10.37	-0.98	0.86	0.95	-	-
Grit	43.08	6.51	-0.12	-0.39	0.78	0.34**	-
Task Performance	32.44	5.13	-0.60	0.04	0.83	0.26**	0.38**

\*\* Correlation is significant at the 0.01 level (2-tailed).

### *Regression analyses*

To test  $H_{2a}$ , which proposed that both perceived P-E fit and grit predict task performance, stepwise multiple regression analyses were conducted in three steps with task performance as dependent variable. In the first step, age was entered as independent variable for the purpose of control variable. At step two of the analysis, P-E fit was entered into the regression equation and statistically significantly predicted the level of task performance  $\beta = 0.12$ ,  $t_{(150)} = 2.98$ ,  $p < 0,05$  (Table 3). P-E fit explained a significant proportion of variance of the task performance level  $R^2 = 0.07$ ,  $F_{(2,150)} = 5.29$ ,  $p < 0.05$ . P-E fit accounted for 6% of the variance in task performance ( $\Delta R^2 = 0.06$ ). At step three of the analysis, grit was entered into

the model. Grit statistically significantly predicted task performance  $\beta = 0.27$ ,  $t_{(149)} = 4.18$ ,  $p < 0.05$ . As can be seen in Table 3, the explained proportion of variance in task performance by grit and P-E fit was significant  $R^2 = 0.16$ ,  $F_{(3,149)} = 9.75$ ,  $p < 0.05$ . Grit accounted for 10% of the variance in the scores of task performance ( $\Delta R^2 = 0.10$ ). Taken together, it can be confirmed that both P-E fit and grit predict task performance ( $H_{2a}$ ). When P-E fit as well as grit were entered in the regression model, P-E fit was no longer a significant predictor of task performance  $\beta = 0.08$ ,  $t_{(149)} = 1.87$ ,  $p = 0.06$ .

Table 3

*Stepwise Multiple Regression analyses with Task Performance as dependent variable.*

Model		Unstandardized		Standardized		t	Sig.	F	R	R <sup>2</sup>	$\Delta R^2$
		Coefficients		Coefficients							
		B	SE	Beta							
1	(constant)	30.81	1.34		23.05	0.00	1.64	0.10	0.01	0.01	
	Age	0.04	0.03	0.10	1.28	0.20					
2	(constant)	26.31	2.00		13.15	0.00	5.29	0.26	0.07	0.06	
	Age	0.01	0.04	0.03	0.33	0.74					
	P-E fit	0.12	0.04	0.25	2.98	0.00					
3	(constant)	18.02	2.74		6.57	0.00	9.75*	0.41	0.16	0.10	
	Age	-0.02	0.03	-0.04	-0.52	0.61					
	P-E fit	0.08	0.04	0.15	1.87	0.06					
	Grit	0.27	0.06	0.34	4.18	0.00					

\*  $p < 0.05$

To test whether P-E fit predicts grit ( $H_{2b}$ ), multiple regression analyses were conducted in two steps with grit as dependent variable. Age was entered as independent variable in the first step for the purpose of control variable. In the second step, P-E fit was entered as independent variable. As can be seen in Table 4, P-E fit statistically significantly predicted the level of grit  $\beta = 0.17$ ,  $t_{(150)} = 3.50$ ,  $p < 0.05$ . P-E fit explained a significant proportion of variance of the grit level  $R^2 = 0.15$ ,  $F_{(2,150)} = 13.48$ ,  $p < 0.05$ . The hypothesis  $H_{2b}$  is therefore supported. The variance in the level of grit was accounted for 7% by P-E fit ( $\Delta R^2 = 0.07$ ).

Table 4

*Stepwise Multiple Regression analyses with Grit as dependent variable.*

Model		Unstandardized		Standardized		t	Sig.	F	R	R <sup>2</sup>	$\Delta R^2$
		Coefficients		Coefficients							
		B	SE	Beta							
1	(constant)	37.33	1.63		22.84	0.00	13.70	0.29	0.08	0.08	
	Age	0.15	0.04	0.29	3.70	0.00					
2	(constant)	30.91	2.42		12.78	0.00	13.48*	0.39	0.15	0.07	
	Age	0.11	0.04	0.20	2.57	0.01					
	P-E fit	0.17	0.05	0.28	3.50	0.00					

\*  $p < 0.05$ **Mediation analysis**

The PROCESS macro was used to test hypothesis H<sub>3</sub>, which proposed that grit mediates the relationship between P-E fit and task performance. The total effect of P-E fit on task performance was significant  $b = 0.13$ ,  $SE = 0.04$ ,  $p < 0.05$ . The results indicated that P-E fit was also a significant predictor of grit  $b = 0.21$ ,  $SE = 0.05$ ,  $p < 0.05$ , and that grit was a significant predictor of task performance  $b = 0.26$ ,  $SE = 0.06$ ,  $p < 0.05$  (Table 5). When grit as well as P-E fit were included in the model the direct effect of P-E fit on task performance became non-significant  $b = 0.07$ ,  $SE = 0.04$ ,  $p > 0.05$ . The indirect effect was tested using a bootstrap confidence interval approach with 1,000 samples. As shown in Table 5, the results revealed a positive indirect effect with a confidence interval slightly above zero  $b = 0.06$ ,  $SE = 0.02$ , 95%  $CI = [0.03; 0.10]$ . Thus, the third hypothesis that grit mediates the relationship between P-E fit and task performance is supported.

Table 5

*Indirect effect of Grit on the Relationship between P-E fit and Task Performance.*

<i>Outcome: Grit</i>						
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
<i>P-E fit</i>	0.21	0.05	4.43	0.00	0.12	0.31
<i>Model</i>	<i>R</i> <sup>2</sup>		<i>F</i>	<i>p</i>		
	0.12		19.65	0.00		
<i>Outcome: Task performance</i>						
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
<i>Grit</i>	0.26	0.06	4.17	0.00	0.14	0.38
<i>P-E fit</i>	0.07	0.04	1.80	0.07	-0.00	0.15
<i>Model</i>	<i>R</i> <sup>2</sup>		<i>F</i>	<i>p</i>		
	0.16		14.56	0.00		
<i>Indirect effect</i>						
	<i>b</i>	<i>BootSE</i>			<i>BootLLCI</i>	<i>BootULCI</i>
<i>Grit</i>	0.06	0.02			0.03	0.10

*Note.* *b* = unstandardized regression coefficient.

## Discussion

To gain a deeper understanding whether certain preconditions need to be present for individuals for being able to generate grit, the aim of this study was to investigate the relationship between P-E fit, grit and task performance. It was specifically aimed at examining whether grit acts as a mediator in the aforementioned relationship and can thereby provide additionally a more comprehensive picture of the mechanisms through which P-E fit is associated with task performance.

The results are in line with the proposed hypotheses. The mediation model implies that P-E fit is indirectly associated with task performance via grit. Thus, although P-E fit was found to be a significant predictor of task performance, which is consistent with several studies within the P-E fit literature that P-E fit is important for employee performance (e.g. Milliman et al., 2017; Oh et al., 2014), the main contribution of this study is that this association was mediated by grit. As such are the hypotheses that P-E fit predicts grit and that grit, in turn, predicts task performance supported. This result is in line with and contributes to other studies of the P-E fit, grit as well as the JD-R model literature (Greguras & Diefendorff, 2009; Duckworth et al., 2007; Xanthopoulou et al., 2007).

Direct effects of P-E fit on performance have been studied to a great amount. However, possible intervening variables that may clarify these direct processes have been studied to a lesser extent (Gregory et al., 2010). As such, this finding adds to the literature by uncovering one of possibly multiple existing underlying mechanisms through which P-E fit perceptions are associated with employee performance. The results of this study confirm that P-E fit does not alone account for high levels of employee performance. Rather individuals achieve performance by holding the ability to overcome setbacks and negative feedback because of a high amount of perseverance and interest. However, it seems that people who perceive a high P-E fit can make use of this ability more easily. The result of this study is consistent with findings of previous studies that attempted to uncover intervening variables, for example, Greguras and Diefendorff (2009) who found that both P-O fit and P-J fit indirectly affect employee performance through competence need satisfaction. It should be mentioned that competence need satisfaction is one facet of self-determination theory (Greguras & Diefendorff, 2009). Gregory et al. (2010) found also a relationship between P-O fit and performance through self-determination and impact. Some studies indicated similarities or associations between these constructs, which were found to be mediators, and grit (Jin & Kim, 2017; Credé et al., 2017). Volition and motivation are for example aspects that have to do with both, grit and self-determination theory (Duckworth & Gross, 2014; VonCulin et al., 2014; Jin & Kim, 2017). Therefore it makes sense that also grit mediates the

P-E fit and performance relationship. It is thus possible that either several mechanisms underlie the P-E fit and performance relationship or that one of the overlapping aspects of these constructs, such as volition, accounts for the underlying mechanism.

Results of earlier studies, which found that grit is a significant predictor of performance across various contexts, support the findings of the present research (Duckworth et al., 2007; VonCulin et al., 2014). The findings are for example in line with the results of Suzuki et al. (2015) who showed that grit is a significant predictor of performance within the occupational context. The main contribution of this study to the grit literature is with regard to the questions whether grit is more like a personal quality that can be influenced by other factors rather than a stable personality trait. The results indicate that grit can be influenced indeed and as such preconditions exist for actualizing one's level of grit. More specifically, it was found that P-E fit is a predictor of grit, suggesting that a high level of perceived P-E fit may be relevant for generating grit. This can possibly be explained by evidence that people try to increase a perceived misfit (Talbot & Billsberry, 2010). As such, a perceived misfit between the employee and the organization is experienced as a challenge and in turn, may hinder the employee in being gritty because the effort is dedicated to establishing fit. Although the basic premise of grit implies that performance is achieved despite the experience of setbacks and challenges, it is possible that a misfit is perceived as such an extreme challenge that the employee is not able to overcome this challenge and is hindered in achieving performance and success. Stated differently, a good fit seems to be necessary for the employee in order to generate grit and in turn to achieve performance.

The JD-R model was applied as a framework to better understand the role of P-E fit and grit in the conceptualized model of this study. In this model was grit described as a personal resource based on previous studies (Hill et al., 2016) and P-E fit as a job resource by being advantageous for the achievement of work related goals or the encouragement of personal development (Bakker & Demerouti, 2007). The results of the mediation analysis of this study get support from previous findings that showed a mediation of personal resources in the relationship between job resources and work-related performance (Xanthopoulou et al., 2007). Bakker and Demerouti (2007) point out that the identification of possible job resources should not be restricted to specific contexts or constructs. The previous study expands on the JD-R model by showing that P-E fit can thus possibly be seen as another job resource, applicable to various occupational contexts. As Xanthopoulou, Bakker, Demerouti and Schaufeli (2009) state, personal resources are in contrast to personality traits malleable thus can be modified over time. P-E fit seems to stimulate or influence grit indeed and thereby also work performance. The definition of grit that gritty individuals are able to overcome setbacks

is accord with the definition of personal resources to successfully deal with the environment. Although other constructs like self-efficacy or optimism have been primarily studied within the JD-R model, it is thus possible that grit functions as a personal resource within this model as well (Xanthopoulou et al., 2007).

### ***Limitations and strengths***

In interpreting the results of this study the following limitations should be taken into account. First, some evidence suggests that the level of grit rises with age (Duckworth et al., 2007; Credé et al., 2017). However, most of the respondents in this study were between 26 and 35 years of age (42.5%). So far it is not evident how great the impact of age is on the level of grit over time, but also in this study was age, as control variable, a significant predictor of grit. Based on the results it was argued that grit is more like a personal quality, because grit was influenced by P-E fit. However, it is possible that the grit-level can be only influenced or easier influenced by P-E fit during young adulthood and remains stable during late adulthood. This would be in agreement with the classical personality development theory, which states that personality traits cannot be influenced once they are fully developed (Roberts, Walton, & Viechtbauer, 2006). In addition to that, age may be an important intervening variable because some evidence suggests that the time employed in an organization is important to employees' fit perceptions (Edwards & Billsberry, 2010). As Edwards and Billsberry (2010) point out the perceived fit of an employee can vary during time. While employees assume to fit the organization based on the first impressions, it is possible that the perceived fit with the overall organization changes after the employee got a more accurate picture of the organization. As a result it could be possible that younger employees, who are employed for a shorter time, perceive a better fit than older employees. However, to ascertain in how far the time employed and age change the level of grit and P-E fit over time, longitudinal studies are necessary.

Secondly, this study was cross-sectional in nature and as such causal inferences cannot be made. For this reason, it could be possible that grit is an antecedent of P-E fit. This would imply that a high level of grit leads to a high level of perceived P-E fit, suggesting that gritty individuals are better able to impact on aspects of their surrounding environment. This would further imply that grit does not account for the underlying mechanism through which P-E fit leads to performance, but that P-E fit may directly affect task performance. Although P-E fit was found to be a predictor of grit and grit was in turn found to be a predictor of task performance, only experimental research can account for causal relationships. Especially, because this is the first study investigating P-E fit as an antecedent of grit, future research

should make use of other research designs. However, other studies within the grit literature found that grit is a predictor of success and performance (e.g. Duckworth et al., 2007). Those studies were longitudinal in nature and give therefore some confidence in the results of this study. Additionally, the conceptual model of this study in which P-E fit is an antecedent of grit seems to be more suitable based on previous studies, which showed that P-E fit is more likely to be indirectly associated with performance (Greguras & Diefendorff, 2009).

Lastly, the present research made exclusive use of subjective self-report measures. This may be especially important regarding the reported task performance level. According to Koopmans et al. (2013) peers or supervisors rate someone's job performance level lower than the employee self. Although the found relationships were statistically significant, only weak to moderate relations have been found. Additionally, the amount of explained variance was relatively small by ranging between 6 and 10 percent. It is possible that even weaker relationships between P-E fit, grit and task performance would have been found if objective measures were used. Hence, it could be argued that both P-E fit and grit are not predictors of performance over and beyond other well-known predictors like general mental ability, which was found to explain variance twice as much as did grit, or even more (Schmidt & Hunter, 2004). However, objective measures are harder to obtain and in addition to that even weak to moderate relations can nevertheless have positive practical outcomes for organizations (Credé et al., 2017), which leads to the explanation of the strengths of the present study.

One of the strengths of this study is that more and deeper insights into the importance of grit are provided. Some studies could not provide evidence for grit as predictor of performance (e.g. Ion et al., 2017). Thus, since grit is quite in its infancy and inconsistencies in the literature exist whether grit is an important predictor of performance, the results of this study contribute to the literature in favor of grit. This study also responds to previous studies that called for further research in two ways. First, Credé et al. (2017) argued that future research should attempt to examine grits' stability before interventions are implemented. Based on the results it can be assumed that grit can be influenced and that possible interventions may have an effect on increasing employees' grit. Secondly, Duckworth et al. (2007) point out that future research should combine grit with other predictors of performance in order to examine in how far these predictors might affect grit. This study made a first step in showing that the ability to be gritty might be amongst other things determined by the perceived fit with someone's organization. Information is provided that certain preconditions may be relevant for individuals for actualizing one's level of grit.

Another strength is that not only deeper insights regarding grit but also regarding P-E fit are given. As already mentioned many studies revealed an association between P-E fit and



performance, but only a few tried to examine whether third variables determine this relationship. This study made another step by showing that one construct, namely grit, which seems to be similar to previously identified mediators can explain the process through which a good P-E fit is associated with employee performance. A high perceived fit with the organization offers a job resource to the employee, which prevents exhaustion and provides the potential for the employee to work with stamina towards performance. This detailed understanding of how P-E fit leads to performance is in turn necessary for the organization, in order to make adjustments or to develop interventions, that aim at increasing employee performance.

### ***Practical implications and directions for further research***

The most important practical implication that results from this study is that P-E fit interventions may be a promising direction for organizations in increasing employee performance. Organizations should focus on the improvement of P-E fit because the results indicate that a good fit is a precondition for generating grit, which in turn leads to high performance. P-E fit interventions may be especially beneficial because employees have to deal with changing and challenging work environments constantly. The outcome of this is that employees need job resources to better cope with these challenges. It is assumed that when job resources, i.e. a good P-E fit, are present in the first place employees will not get exhausted by trying to establish fit and are then able to make use of grit more easily in order to achieve performance. For designing such interventions it is important for organizations to detect where a misfit is present. When for example the skills are not appropriate for the job task, training would be necessary. When on the other hand the tasks are not challenging enough for the employee it would be advisable to rearrange the job or provide additional tasks (Kulik et al., 1987).

In addition to that, another practical implication for organizations would be to focus as much as possible on the fit between prospective employees and the organization during the selection process. Previous studies already indicated that organizations take the fit between person and organization into account during the selection process (Nolan, Langhammer & Salter, 2016). By means of detailed assessment methods regarding the fit between person and organization, it would probably be possible to make a more extensive forecast whether the individual will perceive a good fit in the long-term. Because employees tend to leave organizations where a misfit is perceived (Talbot & Billsberry, 2010), the job tenure may be enhanced by such assessment methods.

It is suggested that future research should concentrate on two issues. First, because this study is cross-sectional in nature it cannot account for causal relationships. Xanthapoulou et al. (2009) found that the relationship between job resources, personal resources and work engagement is reciprocal in nature. However, it should be mentioned that the found reciprocal relationship was based on a longitudinal study rather than an explanatory study. Thus, in the strict sense can the results of Xanthapoulou et al. (2009) not account for causality, too. It is therefore also possible that grit is an antecedent for P-E fit rather than the other way around, indicating that gritty individuals are better able to cope with a misfit as already mentioned before. Future research should make use of explanatory studies in order to identify the causal link between the constructs.

Second, also qualitative research regarding the relationship between P-E fit, grit and performance would provide further insights of the detailed mechanisms in how far P-E fit perceptions are associated with grit. The basic principle of P-E fit lies within the notion that an individuals' behavior is the result of interaction between person and environment. It is possible that quantitative research methods cannot account for the extensive interplay between employee and organization. Qualitative research may be a good attempt to view the employee, nested in the organization as a whole composed of various aspects that are interrelated (Taylor, Bogdan, & DeVault, 2015). In-depth interviews, for example, could be the next step to get detailed information how exactly employees evaluate P-E fit in connection with grit and performance.

### **Conclusion**

This study investigated the relationship between P-E fit, grit and task performance in the occupational context. The results showed that grit mediates the relationship between P-E fit and task performance, providing a first indication that grit may be seen as a personal quality that can be influenced rather than a personality trait. Therefore certain preconditions seem to be necessary in order that individuals can generate grit. Thereby further insights are given into the underlying process through which P-E fit leads to performance, showing that P-E fit leads indirectly to performance via the ability to achieve performance by means of perseverance and interest. This study contributes to the JD-R model by identifying P-E fit as a job resource and grit as a personal resource. Adjustments, in order to increase the perceived P-E fit, may help employees to face the challenges of the 21<sup>st</sup> century.

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