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EDITORIAL

Measuring Work Motivation in Practice-Based Studies

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Measuring Work Motivation

After more than 100 years of research, the measurement of work motivation remains an important topic in the field of human resource development, that has been studied extensively through theoretical and applied approaches. The continued interest in measuring work motivation can be attributed to at least two factors. First, technological advances are driving structural changes in the workplace, such as computer-generated environments and virtual teams working in virtual organizations (Latham & Ernst, 2006). In this dynamic organizational context, assessing the motivation of today's employees is challenging for both human resource (HR) professionals and scholars in the field (Grund et al., 2019; Navarro et al., 2022). Second, measurement is a milestone in the evolution of a research field, defining its limitations and advances and reflecting current thinking on the topic (Mayer et al., 2007). We cannot expect relevant advances in work motivation research and practice without relevant advances in the way motivation is measured. The need for practical, rapid, accessible, and theoretically sound measures of employee motivation has been consistently advocated by scholars and practitioners (Mayer et al., 2007; Tremblay et al., 2009) and now seems more relevant than ever.

Described as one of the most difficult constructs to measure and assess (Slavin, 2019), work motivation is often defined as the force that determines, energizes, and directs work-related behavior resulting from the interaction between the individual and the environment (Kanfer et al., 2008; Latham & Pinder, 2005). It has been extensively studied as a building block for effective leadership and innovative management and has been linked to various facets of employee behavior and organizational outcomes such as job performance, commitment, citizenship behavior, learning, turnover, well-being, engagement, etc. At the same time, work motivation has received some well-founded criticism, being described as a field with a "splintered and perplexing array of theories, few with overwhelming empirical support and most with unresolved theoretical ambiguities and inadequacies" (Klein, 1989, p. 150).

In this seemingly contradictory landscape, reflection on the epistemological background of work motivation measurement might provide clarity and open directions for a critical approach. First, we might take a closer look at the relevant actors or stakeholders involved in the research design of work motivation measurement. Which voices should be considered when designing a study on work motivation measurement? Second, we can reflect on the intertheoretical choice as a critical step in our studies. On what grounds do we choose certain theories over others to measure work motivation? And third, we can

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ask ourselves about the reasons for choosing standardized instruments over ad hoc ones. How do we weigh the advantages and disadvantages of using personalized instruments versus standardized scales?

Voices Considered When Designing a Study to Measure Work Motivation

Assessing employee work motivation requires theoretical knowledge and a specific set of research skills. Modernism and positivism teach us that the authoritative voice in designing a research project is that of the researcher, the "custodian" of scientific knowledge and the holder of expertise in scientific measurement (Wicks & Freeman, 1998). Postmodernism, however, calls for a broader approach in which the interests, knowledge, and perspectives of key stakeholders are integrated from the earliest steps in the design of a study. Thus, the voices of the beneficiaries of the study (the individuals or institutions that fund the study), the voices of the participants in the study, and the voices of those who will feel the consequences of the study would be equally desirable to be heard by the researcher or expert leading the process (Kilduff & Mehra, 1997; Onuț, 2014). In addition, the researcher, who may be the HR professional or an external consultant, should keep in mind the *reflection-in-action principle* that Schön (1987, p. 28) suggestively pointed out decades ago: "Reflection-in-action has a critical function, questioning the assumptional structure of knowing-in-action. We think critically about the thinking that got us into this fix or this opportunity; and we may, in the process, restructure strategies of action, understandings of phenomena, or ways of framing problems".

Keeping in mind both the reflective-in-action principle and the integrative approach, the perspectives and expertise of at least the employer/funder and the employees could add value and insights to the process, as both have in-depth knowledge of the organizational reality that is hardly accessible to a consultant or external researcher (and even to an internal HR professional). Thus, careful analysis and integration of the knowledge and input that each stakeholder can bring to the measurement of work motivation could be a way to improve the measurement process and increase the chances that the results will be implemented to lead to authentic and long-term organizational change.

Intertheoretical Decision Making

Choosing the appropriate theory or theories (i.e., intertheoretical decision-making) is a challenging step in measuring work motivation because it creates the "blueprint" for the entire process (Grant & Osanloo, 2014). Thus, the chosen theory or theories will guide the measurement and data analysis and provide the framework for sound recommendations and actions to increase employee motivation. In this context, study coordinators, whether researchers or HR professionals, should know the answer to the questions: How do we select the appropriate theory or theories to measure work motivation in the current organization or for the current client? What criteria should be used to reduce the risk of selecting an inappropriate theory? Although this issue is addressed in some of the social science methodology manuals, the guidance is scarce and tends to be formulated as general suggestions, i.e., fit the objectives or relate to the field of study, etc.

Originally developed for management studies, Wacker (1998, p. 365) provides a list of "virtues" of a "good" theory that could guide the selection from a list of competing theories: (1) uniqueness - the theory is different from other work motivation theories; (2) generalizability – the theory is more virtuous if it can be applied more broadly; (3) fertility - a work motivation theory that is more fertile in generating new models and hypotheses is better than a theory that has fewer hypotheses; (4) parsimony - if two theories are otherwise equal, the one with fewer assumptions and definitions is more virtuous; (5) internal consistency - the theory logically explains the relationships between concepts (that are logically compatible with each other); (6) empirical risk - any empirical test of a theory should be risky, the theory that

predicts the least likely event is considered the superior theory; (7) abstraction - if one of two competing theories integrates more internally consistent concepts, it is more virtuous.

Standardized or Ad hoc Measures

The decision to select standardized scales or to develop personalized measures is a third critical decision in assessing work motivation in practice-based studies. As the literature shows, each strategy has advantages and disadvantages (Heggestad et al., 2019, Iliescu & Tînculescu-Popa, 2023). However, taking into account the characteristics of the organization and the perspectives of the relevant stakeholders, after selecting the appropriate theory or theories on which to base the measures, a literature search should be conducted to identify the tools already developed and validated for each selected theory. Thus, in line with the recommendations of Iliescu and Tînculescu-Popa (2023), the use of standardized measures within a personalized research design should be considered for a sound project. If this strategy is adopted, careful consideration should be given to all aspects related to the psychometric properties of the instruments, including the limitations of translation procedures, as one of the most common forms of adapting a scale (Klotz, 2023).

If a customized approach is chosen, the rigors of developing dedicated scales or items to measure work motivation should be followed. In this scenario, trained researchers can join the team to contribute to the development of the data collection instrument and take advantage of the inclusion of personalized items that address the specifics of the organization being studied.

Conclusions

Measuring employee work motivation continues to be a topic of great interest in both basic and applied research. Although there are well-established theories and conceptual models, a practice-based study that takes into account the specific needs of the client organization poses challenges in terms of both the epistemological framework and the technical implementation. However, integrating the perspectives of relevant stakeholders (client, employees, study participants, researcher), following a reflection-in-action approach throughout the study, and carefully considering the measures employed can minimize the risk of error and maximize the applicability of the results. Thus, we reiterate the call to action for researchers and practitioners to adopt a holistic approach that integrates stakeholder perspectives, reflective practices, and rigorous measurement techniques to advance work motivation research and practice.

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RESEARCH ARTICLE

Dimension- or Task-based Assessment Centers? A direct comparison study of two measurement approaches

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Abstract

This study investigates two divergent strategies for assessment center ratings, dimension-based assessment centers (DBAC) and task-based assessment centers (TBAC), in order to directly compare their model fit using the same data. The sample consisted of 126 Romanian students who took part in an Assessment and Development Center. The assessment center matrix included two exercises, analysis and in-tray, and two traditional dimensions, problem solving and organizing and planning, as well as one task-based dimension. Findings confirmed that the TBAC model performs significantly better than the DBAC model. Implications regarding the construct validity of TBAC ratings and internal reliability of DBAC ratings are discussed.

Keywords

assessment centers, dimension-based, task-based, confirmatory factor analysis

Assessment Centers (ACs) have gained much popularity among both practitioners and researchers over the past several decades. They are highly valued in personnel selection for both what they measure and how they measure it (Lievens & Thornton, 2017; Thornton & Rupp, 2006). The behavioral dimensions assessed within ACs are directly linked to job performance criteria. These are measured in different exercises that simulate tasks related to the job. Following a multitrait-multimethod (MTMM) approach derived from a thorough job analysis (Campbell & Fiske, 1959), the ACs' outcomes are of high practical relevance in regard to both prediction of future performance and developmental feedback (Arthur et al., 2003; Gaugler et al., 1987; Sackett et al., 2017; Schmidt & Hunter, 2016).

Notwithstanding, a significant amount of research has revealed evidence that does not completely support a MTMM approach in ACs. The debate was started by Sackett and Dreher (1982) and was continued by other researchers (Arthur et al., 2008; Bowler &

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Woehr, 2006; Cahoon et al., 2012; Fleenor, 1996; Hoffman et al., 2011; Kuncel & Sackett, 2014; Lance, 2008) to conclude that AC dimension ratings are not consistent across all the exercises in which they are designed to be measured, but that instead these are rather situational, relative to a certain context. This conclusion questioned the construct validity of AC ratings, as well as their reliability and led to two broad schools of thought in regard to how these behavioral constructs should be operationalized. One of them is in favor of a traditional dimension-based approach towards behavioral ratings (DBAC) (Arthur et al., 2003; Bowler & Woehr, 2009; Meriac et al., 2008), while the other promotes a task-based approach (TBAC) focused on performance in exercises (Goodge, 1988; Hoffman et al., 2011; Jackson et al., 2010, 2016; Jackson & Englert, 2011).

While the TBAC approach seems to be an alternative to DBAC, the two models have so far been studied only independently, i.e., without being directly compared against each other. Our study addresses this gap by comparing the two divergent assessment strategies in ACs, and judging their relative merit based on model fit measured against the same data sample.

What do DBACs and TBACs measure?

DBACs have traditionally been used in organizational practice, and most psychometric characteristics of AC ratings have been studied through this model. Driven by the theoretical MTMM approach (Campbell & Fiske, 1959), DBACs are designed based on an AC matrix that contains two components: traits and methods, defined as dimensions and exercises. The AC matrix is derived from an analysis of the targeted job profile, which offers the relevant input for operationalizing dimensions as well as for the selection of tasks that are then to be simulated in exercises (Thornton & Rupp, 2006).

Each dimension aims at measuring a specific competency, described by a range of behaviors that are expected to lead to the desired performance, if they are efficiently manifested in tasks. Applying the MTMM principles, each dimension should be assessed in more than one exercise (Rupp et al., 2015). Thus, each behavior is measured within each exercise resulting in a post exercise dimension rating (PEDR). PEDRs are quantitatively and/or qualitatively integrated in an overall rating per dimension and, further, in an overall assessment rating (OAR) (Lievens et al., 2008; Kleinmann & Ingold, 2019).

Dimensions measure what a person is able to do in specific performance situations, and not what they *could* do or their potential to perform (Arthur et al., 2008). A wide range of aspects may be taken into consideration when defining dimensions, such as the capability to find solutions to problems, provide performance feedback to an employee, hold a business presentation etc. Meta-analytic studies suggested that the constructs for DBAC could be grouped in 6 narrow categories: (a) consideration/ awareness of others, (b) communication, (c) drive, (d) influencing others, (e) organizing and planning, and (f) problem solving, being emphasized a true criterion-related validity ranging from .25 to .39 (Arthur et al., 2003). In addition, a good criterion-related validity was highlighted for OARs, larger than and incremental over other psychological traits (Gaugler et. al., 1987; Meriac et. al., 2008; Sackett et. al., 2017; Schmidt & Hunter, 2016).

TBAC came out as an alternative to the traditional DBAC (Gorham, 1978; Jackson et al., 2010), promoting a 'dimensionless' design approach to AC (Iles, 1992). It attributes a greater importance to the effects of exercises, focusing on measuring merely the behaviors directly involved to perform the tasks. The design of TBAC relies on tasks resulted from job analysis, which are simulated in exercise and then operationalized into specific behaviors. Behaviors might differ from one exercise to another, and they do not necessary underlie a specific trait. They are rated within the exercise and, afterwards, integrated in an overall exercise rating and OAR computed based on exercise ratings (Jackson et al., 2010).

The similarities as well as differences between DBAC and TBAC were analyzed by Jackson et al. (2010) and are presented in Table 1.

Table 1. *Dimension-based versus task-based assessment center design features*

Dimension-based	Task-based
Simulation exercises form the backbone of the assessment	Same
Use of multiple assessors	Same
Use of standard-setting training	Same
Pooling of scores by way of clinical discussion or arithmetic integration	Same, except arithmetic pooling is preferred
Based on job analysis	An even greater focus on the importance of job and task analysis
Design focus is on the identification of relevant dimensions	Design focus is on the job-relevance of exercise content
Simulation exercises are used for the assessment of alleged dimensions	Simulation exercises are used for the assessment of work-related behavioral output
Correlated exercise effects interpreted as method bias	Correlated 'exercise effects' interpreted as evidence for general and situationally-specific performance
Scored on the basis of same dimensions aggregated across exercises plus an overall rating	Scored on the basis of behavioral checklists aggregated within exercises plus an overall rating
Intended to tap alleged cross-situationally stable dimensions as output	Intended to tap general performance and situationally-specific elements of performance as output
Formalizes assessment around underlying characteristics	Formalizes assessment around observable behavior
Engages assessors in relatively complex cognitive processes around cross-situational stability	Simply scored within exercises, yet implicitly acknowledges the complexity of behavioral output
Feedback is provided in terms of global dimensions that may succumb to exercise effects	Feedback is provided on the basis of behavioral responses within exercises

Source: Jackson et al., 2010

Debates about the internal consistency of DBAC ratings

A gap between the theoretical MTMM approach applied in DBACs and the available empirical evidence reveals that DBACs have a low internal consistency of ratings across the exercises (Lance et al., 2004; Lievens & Conway, 2001; Sackett & Dreher, 1982). Despite the initial assumption that dimensions were stable cross-contextual constructs, a larger number of recent studies have emphasized that these do not work as they were expected to and that the correlation of the same PEDRs between exercises is actually lower than the correlation of different PEDRs within the same exercise.

The conclusion that dimensions are not (or at least to a certain extent not) equally displayed in all exercises in which they are measured questioned the reliability of DBAC ratings and, implicitly, that of AC methodology (Lance et al., 2000). This idea was overcome by a number of studies that

have shown that the issue regarding reliability of DBAC ratings does not concern a methodological bias (Arthur et al., 2008), but actually the reliable variance in AC ratings is attributed to exercises and to a general performance factor (Jackson et al., 2010, 2016; Putka & Hoffman, 2013).

The current state of knowledge in this domain is thus one of uncertainty: the psychometric properties of TBACs are understudied, but on the other hand DBACs may be saved by models emphasizing broad dimensions, that show better results. It is clear that, based on the issues concerning the internal consistency of AC ratings, it is possible that the TBAC approach may be a better alternative to the traditional DBAC approach, since its measurement strategy is focused on the actual performance in exercises, i.e., the factor that explains the most reliable variance in AC ratings. Nevertheless, other psychometric properties of TBACs are understudied, and their uncritical embracement may be premature (Hoffman et al., 2011). On the other hand, other solutions may improve the internal consistency of DBACs: newer studies have found a better fit for models using broad dimensions, such as broad managerial skill dimension taxonomies (Hoffman et al., 2011; Shore et al., 1990).

The current study

The conclusion that TBAC could be a better alternative to DBAC has been reached from two independent research directions: one that has shown that dimensions used in DBAC are not cross-contextual and the second that has found that reliable variance in ratings is attributed to performance in exercises. These two approaches have not been directly compared so far. The current study addresses this gap and compares the model fit resulting from the two measurement strategies – DBAC and TBAC - on the same data sample.

Research Question: Will a CFA model that relies on TBAC show better fit to the data than a model based on DBAC?

Method

Participants and Procedure

The sample consisted of 126 Romanian students who took part in a developmental AC. In terms of demographics, mean age of participants was 22.28 years (SD = 5.76), 51% of the sample were females and 49% males, 87% undergraduate students and 13% postgraduates. Participants were invited to enroll in an Assessment and Development Center with the help of different organizations such as the College Student Counseling Centers and several NGOs for students, as well as via announcements posted on social media platforms such as Facebook and LinkedIn. During the application process, participants were presented with the purpose of the research and invited to voluntarily enroll in the study. After the enrollment, they received an online invitation for two AC exercises. Both exercises were time limited to three hours. Participants were allowed to solve the exercises at a time of their choosing and responses were collected in writing via an online assessment platform. At the end of the AC, participants received a development report and could opt for a one-on-one feedback session with the assessors.

Assessors

The team of assessors consisted of 16 psychology master students (average age = 24.31 years, *SD* = 2.75, 86% females). Ahead of the actual AC, the assessors participated in two days of frame-of-reference training (Roch et al., 2012), during which they were provided with the relevant details about the methodology and procedure of the AC. Also, the training included information about the dimensions measured, exercises and examples of good and poor performance behaviors, as well as practice sessions.

Variables

For the design of the AC, a taskforce was created, which consisted of three subject matter experts who were senior professionals certified in A&DC methodology. The taskforce analyzed the profiles of top performing students, and consulted the

literature to identify key factors of academic performance. Based on this analysis, we identified that high performing students tended to get involved in extracurricular activities, such as volunteering at conferences or for work in student associations. Therefore, two exercises – analysis and in-tray, were designed to simulate tasks related to extracurricular activities for students (Thornton & Rupp, 2006).

Within the analysis exercise, participants took on the role of the Student Council President at an imaginary university. They were asked to analyze information regarding a master program and propose solutions to improve the program. In the in-tray exercise, participants took on the role of a volunteer coordinator at a conference and were asked to plan and organize the conference.

Two key predictors for academic performance were identified: general mental ability (Kuncel et al., 2004) and conscientiousness (Poropat, 2009). For the DBAC model, two dimensions – problem solving and organizing and planning – were operationalized based on these traits. The dimensions were defined using the taxonomy proposed by Arthur et. al. (2003). The behavioral items are presented in Appendix 1. For TBAC, tasks related to each exercise were operationalized into behavioral indicators. The items are shown in Appendix 2.

After the participants completed the exercises, assessors independently scored dimensions for both the DBAC and TBAC models, directly in the assessment platform. Each behavioral item was rated by two assessors on a 1-5 scale (1 – poor performance to 5 – excellent performance). The final ratings were computed based on an assumption of equal weights (averages).

Materials are openly shared here: https://osf.io/de8vt/?view_only=80fbe722b27840748f987758f18f5ae3

CFA Models

We tested the alternative CFA models using the lavaan package in R (Rosseel, 2012). Consistent with previous research, we fit two different CFA models in order to evaluate the dimensionality underlying the AC ratings as follows: *Model 1* (a *K*-exercise-*J*-dimension model) fit 2 correlated exercise factors and 2 correlated dimension factors, being related to the DBAC approach (Anderson et al., 2006; Bowler & Woehr, 2006; Hoffman et al., 2011), and *Model 2* (a *K*-exercise-one-dimension model) fit 2 correlated exercise factors and one dimension factor, related to TBAC approach (Hoffman et al., 2011; Lance et al., 2004).

In order to test the model fits, we examined the standardized maximum likelihood parameter estimates to determine whether a proper solution had been obtained. We eliminated items that were inconsistent with the data (Byrne, 2011; Hoffman et al., 2011), taking into account the standardized factor loadings and factor correlations. The final models were evaluated based on the chi-square statistic, the root mean squared error of approximation (RMSEA), Bentler's (1990) comparative fit index (CFI) and the Tucker–Lewis index (TLI) (Hu & Bentler, 1999). The two models were compared with each other using Vuong's test (Vuong, 1989).

Results

Table 2 presents the descriptive statistics for the AC dimensions. The average ratings of dimensions ranged from 1.98 (SD = 0.77) to 3.15 (SD = 0.87). The internal consistency was above .90.

Table 3 shows the CFA model fit indexes. After the examination of the standardized maximum likelihood parameter estimates, proper solutions were obtained for both models, with good fit indexes (Hu & Bentler, 1999): *RMSEA* values below .08 (.05; .06) as well as values of $CFI \geq .95$ (.98; .98).

The comparison analysis showed that *Model 2* (TBAC model) fits better to the data than *Model 1* (DBAC model) ($z = -16.15$, $p < .001$), confirming the *Research Question*.

Table 2. *Descriptive Statistics*

Dimension	*M*	*SD*	Alpha Cronbach
Case Study			
Problem Solving	2.64	0.90	.96
Organizing and Planning	1.98	0.77	.91
Task-based Dimension	2.39	0.87	.93
In-basket			
Problem Solving	3.13	0.84	.97
Organizing and Planning	3.15	0.87	.94
Task-based Dimension	2.99	0.87	.91

Table 3. *Confirmatory factor analysis model fit statistics and Vuong's Test*

Model	***Chi-square***	***df***	***p***	***CFI***	***TLI***	***RMSEA***
Dimension-centric model (Model 1)	191.82	146	<.01	.98	.97	.05
Task-based dimension model (Model 2)	48.00	34	<.05	.98	.97	.06
Vuong's Test	z	p				
Model 2 fits better than Model 1	-16.16	<.001				

Discussion

Our study directly compared the two competing assessment strategies of DBAC and TBAC against the same data sample. The results supported the latter approach, indicating better fit indexes for TBAC model.

The TBAC Model

TBAC came out as a promising alternative in reply to the low internal consistency of DBAC ratings. However, despite the fact that the TBAC approach addresses the lack of practical relevance of dimensions in the DBAC model (Jackson et al., 2016), it also brings with it some methodological shortcomings, the main one being in regard to the construct underlying AC ratings.

Construct Validity of TBAC ratings

The construct validity of TBAC ratings is understudied. The general assumption is that they group in a general dimension representing participant performance (Jackson et al., 2016; Jackson et al., 2010); even though TBAC ratings are correlated with other traits, they are not actually assumed to be based on a specific psychological dimension.

Performance in AC exercises is rather seen as a different construct, that varies from one assessment and performance context to another. The whole mechanism is explained through a systematic-deterministic approach where multiple factors concerning participant, organization, exercise design and raters interact and lead to the actual performance that

is displayed in each context (Jackson et al., 2010).

In any case, more evidence is needed to establish whether TBAC should be defined as a psychological construct operationalized by a number of dimensions, or if it is indeed based on one general performance factor. New research could explore whether task-based performance as shown in TBAC ratings may be grouped in taxonomies.

Is performance in TBAC measured appropriately?

Another shortcoming of the TBAC approach is related to the manner in which the performance factor is measured. Since it is viewed as a construct that changes from one context to another, the MTMM principle that a trait (dimension) should be measured by multiple methods (exercises), is not met (Rupp et al., 2015). Further research into the TBAC approach could investigate whether a model in which the same tasks are measured in multiple exercises leads to better results in terms of construct validity, as well as whether same task-performance is cross-contextual.

The DBAC model

Even though the comparison between the two models supported TBAC, good fit indexes were also obtained for DBAC. Other studies indicated low fit indices for DBAC models (Hoffman et al., 2011; Lance et al., 2000). One of the reasons for obtaining a good fit could be related to the parsimony of our model. The model included only two dimensions defined based on the key predictors for academic performance: general mental ability (Kuncel et al., 2004) and conscientiousness (Poropat, 2009). We also point out that the limited number of dimensions may affect the construct validity of the model (Gaugler & Thornton III, 1989).

Dimensions in the DBAC approach are well studied (Arthur et al., 2003; Bowler & Woehr, 2009; Meriac et al., 2008). DBAC models follow the MTMM methodology, attempting to operationalize performance in ACs as comprehensively as possible using multiple dimensions that are measured in multiple exercises. The dimensions are defined based on the ideal profile of the targeted job, focusing on its key psychological traits, which are therefore operationalized into behaviors. It is assumed that psychological traits that are behind each behavior are activated in the exercises. Each situation provides cues that trigger specific traits which lead to the manifestation of behaviors and, thus, to performance in exercises (Lievens et al., 2006).

The drawback of the DBAC approach is related to the traits underlying the dimensions, which are differently activated from one situation to another as well as to the fact that different traits may interact within the same context and overlap their effects in the manifestation of the behaviors (Haaland & Christiansen, 2002). Nevertheless, some studies indicated that models with dimensions spanning broad factors turned out to be a better fit to the data (Hoffman et al., 2011). DBAC designs based on broad performance factor models such as Shore's (1990) may lead to superior results in terms of both construct validity and the internal reliability of AC dimension ratings.

Limitations

One limitation of the study is related to the sample that consists of students, most of them undergraduates. The participants took part in ACs for research purposes and were provided with the development opportunity to receive a one-on-one feedback session. The models were not tested on data collected from real ACs used in selection or development processes for employees and, thus, this might limit the extent to which the conclusions of this study may be generalized to employee samples.

A second limitation concerns the number of dimensions used for testing the models, which may influence the construct validity of the models (Gaugler & Thornton, 1989). For instance, multiple dimensions included in the TBAC model could have reduced its parsimony and weakened the fit indexes, while for a DBAC model more dimensions could have led to obtaining unacceptable fit indexes (Hoffman et al., 2011; Lance et al., 2000).

A third limitation is posed by the fact that the models were tested only in written

exercises. The assessors only evaluated responses submitted by the participants, without having the opportunity to prompt behaviors, as it usually happens during interactive, "live" exercises. This hampers the generalizability of our conclusions to other types of AC exercises.

Practical Implications and Future Research

The results of our study revealed superior fit indices for a TBAC model when directly compared to DBAC, supporting a task-oriented measurement strategy in ACs (Hoffman et al., 2015; Jackson et al., 2010, 2016). Despite promising results, more evidence is needed to move from a traditional dimension-based assessment to a task performance-based approach.

For future research, we recommend replicating this study on data collected from ACs conducted in selection/promotion or development processes in organizations to investigate whether the same results are achieved in real-life situations. The research design could be expanded by defining models that include a wider range of competencies, tasks and types of exercises derived from job analyses of roles within organizations.

Another issue worth considering for future research is the criterion-related validity of TBAC models compared to DBAC. By showing higher internal consistency, it is assumed that TBAC ratings might predict future job performance better than DBAC ratings. However, the criterion-related validity of TBAC models has not been widely studied and little is known about how behavioural ratings are related to future outcomes. New studies in this area may highlight differences, such as the fact that TBACs better predict task performance, while DBACs better predict contextual performance (Motowildo, Borman & Schmit, 2009).

Finally, more evidence is needed to fully understand what constitutes performance in the TBAC approach and whether certain psychological traits underlie it. To integrate MTMM principles into TBAC design, we recommend testing models that include homogeneous task dimensions (e.g., customer relationships) and evaluating them in multiple contexts (e.g., two role-plays both simulating customer interactions). Alternatively, DBAC internal consistency issues could be addressed by using broad dimensions models derived from established performance taxonomies such as Shore's (1990) and, thus, a mixed approach between the two models, DBAC and TBAC, could lead to superior results in terms of internal consistency, construct validity and criterion-related validity.

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Appendix 1

DBAC Behavioral Items Description

Problem Solving

Negative Behaviors	Positive Behaviors
Misses information when analyzing, takes into account a limited number of available data.	Analyzes a large amount of information available.
Does not generate ideas or solutions for existing problems.	Generates multiple ideas or solutions to solve existing problems.
Does not look for new information, relies on existing information when solving problems.	Search for new information in order to better understand the existing problem.
Does not have a clear understanding, misinterprets information from the brief.	Has a clear understanding of the information provided, understands the context of the exercise in its complexity.
Mixes up essential information with irrelevant details.	Identifies the essential elements
Does not propose actions to solve problems, adopting a passive approach.	Selects a course of action in order to effectively solve problems.
Does not efficiently use existing resources to solve problems.	Looks for new ways to use existing resources to solve problems in the most efficient way.
Does not generate imaginative solutions.	Generates and recognizes imaginative solutions.

Organizing and Planning

Negative Behaviors	Positive Behaviors
Approaches tasks in a disorderly, unstructured manner.	Has a systematic and orderly approach to tasks.
Does not efficiently organize the work of others in order to ensure the fulfillment of tasks.	Effectively organizes the work of others in order to fulfill the tasks.
Does not anticipate factors that could appear along the way and impact the achievement of objectives.	Anticipates factors that could intervene along the way.
Does not keep track of activities.	Keeps track of activities.
Does not effectively prioritize activities.	Effectively prioritizes activities.
Does not establish a timeline of activities.	Establishes a timeline of activities.
Focuses on immediate problems, makes short term plans.	Plans long-term activities.

Appendix 2

TBAC Behavioral Items Description

Analysis Exercise

Negative Behaviors	Positive Behaviors
Is not aware of the strengths and weaknesses of the master's program, does not take into account the results from the university rankings.	Highlights the strengths and weaknesses of the master's program.
Does not analyze the information from the student satisfaction survey nor the typology of the master's students.	Effectively uses the information from the student satisfaction survey, and other information/trends.
Does not analyze the revenues which could be obtained by transforming the current master's program.	Calculates how much the income would increase and what would be the financial benefits that could be obtained by implementing the new initiative.
Is unspecific about the master's initiative, does not have a clear understanding of the context.	Effectively identifies the advantages and disadvantages of the options for the master's program; makes well-reasoned recommendations regarding new initiatives.
Does not address the topic of the online platform.	Proposes solutions to effectively manage logistics costs; makes recommendations regarding the e-learning platform.
Does not take into account the needs and profile of the teachers when making recommendations.	Proposes actions to address teachers' needs; takes into account their typology when making recommendations.

In-tray Exercise

Negative Behaviors	Positive Behaviors
Does not address the issue about keynote speakers (considers little information about keynote speakers, offers vague recommendations).	It presents clear recommendations regarding the choice of keynote speakers, offering arguments based on a comprehensive analysis.
Does not propose recommendations for choosing the topic; the implications of the topics chosen are not clear to them.	Demonstrates that is aware of the implications of the topics chosen.
Does not realize that the budget is exceeded; proposes vague solutions.	Calculates exactly how much the budget is exceeded, proposes solutions to accommodate the needs of the project.
Does not address the topic of the promoting campaign.	Comes up with new ideas and a plan for the promoting campaign.
Is not concern of the project team.	Proposes actions to organize the project team; considers the needs of the project, looking for suitable people for the new roles.

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RESEARCH ARTICLE

Self-Leadership and Task, Contextual, and Creative Performance: Investigating The Mediating Role of Job Crafting

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Abstract

Employees' work performance is influenced by a number of factors, including the leadership style of their supervisors. However, in certain situations, despite the fact that managers have dysfunctional leadership styles or they avoid managerial responsibilities, followers perform well. A possible explanation is that employees perform well in such situations because they lead themselves, without needing the influence of direct supervisors. In order to test this hypothesis, we investigated the link between self-leadership and three types of performance: task, contextual, and creative performance. Also, we tested the mediating role of job crafting in the relationships between self-leadership and performance. The study was conducted on a sample of 282 employees. The results indicated that self-leadership is positively associated with the three types of performance. Moreover, job crafting mediates the relationships between self-leadership and all three forms of work performance. From a theoretical perspective, this study suggests that employees can have a high performance despite ineffective or absent leaders when they adopt self-leadership strategies. From a practical point of view, our results indicate that organizations may use self-leadership interventions in order to stimulate employees' job crafting behaviors and performance.

Keywords

self-leadership; job crafting; task performance; contextual performance; creative performance

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Ethical Statement
All procedures performed in the study were in accordance with the ethical standards of the institutional and national research committee.

Informed Consent
Informed consent was obtained from all individual participants involved in the study.

Data Availability
The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Introduction

Work performance is one of the most important variables in industrial and organizational psychology (Carpini, Parker, & Griffin, 2017) due to the impact it has on organizational bottom line, turnover, and organizational performance at large (Pandey, 2019). Considering the importance of work performance, researchers tried to identify the factors associated with it (Pandey, 2019). A broad area of research indicates that certain leadership styles (e.g., transformational, transactional) increase different types of subordinates' performance, such as task, contextual, and creative performance (Chen, Jia, Li, & Zhang, 2021; Wang, Oh, Courtright, & Colbert, 2011). At the same time, destructive management styles (e.g., abusive) negatively influence the work performance of employees (Schyns & Schilling, 2013) and, in certain situations, managers even avoid leadership responsibilities (i.e., laissez-faire leadership). Therefore, the performance of employees can be diminished by inappropriate leadership styles or by the lack of involvement of managers. However, the concept of self-leadership challenges the assumption that the leadership process requires a leader and a follower and proposes a process of influencing oneself, without the need for a leader (Stewart, Courtright, & Manz, 2019). Therefore, even in situations where the leaders are absent or do not have adequate behaviors, employees can reach positive results by leading themselves. Indeed, the existing literature has identified a number of positive outcomes of self-leadership, such as performance, innovation, self-efficacy, job satisfaction, and work engagement (Knotts et al., 2022). However, it is not completely known what are the processes through which self-leadership leads to these positive consequences.

In order to address this gap in the literature, the aim of this study is to test the mediating role of job crafting in the relationship between self-leadership and job performance. Based on social cognitive theory (Bandura, 1986), control theory (Carver & Scheier 1982), and self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), we expect job crafting to mediate the positive link between self-leadership and three types of performance: in-role (efficiency in performing the central duties of the position), contextual (individual behaviors that go beyond the formal duties of the position and that improve the working environment), and creative performance (generating new and useful procedures, ideas, and product improvements) (Koopmans et al., 2011). From a theoretical point of view, the current study highlights the importance of self-leadership in predicting different types of performance, indicating a possible explanation for the high performance of some employees in situations where supervisors are absent or have ineffective behaviors. Moreover, it provides an explanatory mechanism (i.e., job crafting) for the positive relationship between self-leadership and several forms of performance. Regarding the practical implications, the study may indicate that self-leadership interventions could be an effective solution for increasing employees' job crafting behaviors and job performance.

Self-Leadership and Job Performance

Self-leadership represents a process through which individuals analyze themselves and regulate their own behavior in order to reach a desired result by using a specific set of cognitive and behavioral strategies (Neck & Houghton, 2006). There are three types of self-leadership strategies that employees can use: behavior-focused strategies, natural reward strategies, and constructive thought strategies (Houghton & Neck, 2002; Houghton, Dawley, & DiLiello, 2012). By using behavior-focused strategies, employees replace the behaviors that do not lead to a desired result with other behaviors that are more adequate in achieving the proposed objective (Neck & Houghton, 2006; Houghton et al., 2012). These strategies are self-observation (monitoring one's own actions in order to identify behaviors that must be changed, improved or eliminated), self-goal setting (the formulation of specific objectives that the person wants to achieve), self-reward (offering rewards to oneself for self-motivation), self-correcting feedback (the negative evaluation of ineffective and

inadequate behaviors with the aim of replacing them), and self-cueing (using certain cues from the environment to stimulate the desired behaviors, such as motivational posters and notes) (Neck & Houghton, 2006).

Natural reward strategies are used by employees in order to make the tasks or work activities more pleasant and rewarding (Neck & Houghton, 2006). The two strategies proposed in the self-leadership literature are (1) making tasks more pleasant by adding certain rewarding or pleasant characteristics and (2) changing the perception of tasks by focusing on their pleasant aspects (Houghton & Neck, 2002; Houghton et al., 2012). Finally, constructive thought strategies refer to ways in which employees can develop a pattern of thinking that facilitates performance and includes evaluating own thoughts and assumptions in order to eliminate the dysfunctional ones, mental imagery (envisioning the successful completion of tasks before starting them), and positive self-talk (an optimistic and encouraging inner dialogue) (Neck & Houghton, 2006; Houghton et al., 2012). The concept of self-leadership is grounded in several classic theories, such as social cognitive theory (Bandura, 1986), control theory (Carver & Scheier 1982), and SDT (e. g., Deci & Ryan, 1985; Ryan & Deci, 2000). These theories propose a series of mechanisms (self-efficacy, work engagement) that can explain why employees who use self-leadership strategies perform better (Hauschildt & Konradt, 2012).

Control theory (Carver & Scheier 1982) suggests that individuals make comparisons between a desired state and the current reality and, when there is a discrepancy between the two, they direct their behavior to reduce the discrepancy and reach the desired state. These self-regulatory efforts can be effective or they can fail. After people perform certain actions, they evaluate whether or not they led to the desired result. If the behavioral changes did not lead to the established objective, then the persons direct their efforts to other actions that could lead to the desired state. The strategies within self-leadership are proposed as ways that can lead to self-regulatory effectiveness (Neck & Houghton, 2006). For example, the constructive thought strategies can improve goal setting, orient behavior in a certain direction, and maintain motivation for desired behaviors (Neck & Manz, 1992). Therefore, it is expected that self-leadership strategies to improve behavioral regulation and increase the chances that individuals will reach the desired state. In general, in the workplace, the desired state is established by the organization's requirements and implies task performance or other forms of performance, such as contextual or creative performance.

Next, social cognitive theory (Bandura, 1986) suggests that individuals self-regulate their behavior by establishing performance standards that they then try to achieve. This process begins with the analysis of previous experiences so that people can realize how well they have performed in the past in certain activities (Neck & Houghton, 2006). Previous success in these activities builds self-efficacy, representing people's confidence that they can accomplish certain tasks (Bandura, 1986). The more confident people are in their own abilities, the higher the performance standards they impose on themselves will be, which will motivate them to make an effort and change their behavior to meet those standards (Neck & Houghton, 2006). Self-observation and self-goal setting are two behavior-focused strategies specific to self-leadership that can build self-efficacy and regulate work behavior towards performance. In line with social cognitive theory (Bandura, 1986), self-efficacy mediates the link between self-leadership and performance (Panagopoulos & Ogilvie, 2015; Prussia, Anderson, & Manz, 1998).

Finally, SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) is a theory that aims to clarify why people do what they do. It acknowledges a spectrum of motivational regulations, ranging from intrinsic motivation to various forms of extrinsic motivation and amotivation. When used in an occupational context, motivation refers to the forces that determine the direction, intensity, and duration of an individual's behavior at work (Pinder, 2008). Six motivational categories are identified by SDT (Manganelli et al., 2018). Amotivation refers to the lacking of intention to act (Ryan & Deci, 2000). Extrinsic motivation can be divided into four categories: (a) external motivation, which occurs when people behave in a certain way to obtain rewards or to avoid

punishments; (b) introjected motivation, which occurs when people act out of shame, guilt, or pride; (c) identified motivation, which occurs when the individual chooses to engage in a behavior because he or she considers it useful in achieving an important and valuable objective, (d) integrated motivation, which occurs when people choose a certain behavior because it is consistent with their deeply held beliefs (Van den Broeck et al., 2016; Deci et al., 2017; Ryan & Deci, 2000).

Conversely, intrinsic motivation describes the enjoyment and pleasure that come from the activity itself; the activity serves as both the "reward" and the driving force (Deci et al., 2017). Three fundamental psychological needs must be met for an activity to be considered motivating in and of itself, according to SDT. These needs are the need for autonomy (the desire of employees to decide what behaviors they engage in without being constrained by the work context), the need for relatedness (the desire of employees to develop close relationships in the professional environment and to belong to a group), and the need for competence (the employees' desire to have a sense of mastery over the work tasks and the work environment). According to the theory, when these needs are satisfied, employees are more intrinsically motivated, are more involved in their work, and are willing to put in more effort. Meta-analytical findings (Van den Broeck et al., 2016) support these predictions, indicating that basic psychological needs satisfaction is positively related to engagement, satisfaction, task performance, contextual performance, and creative performance.

The SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) can explain why employees engage in self-leadership behaviors. In terms of extrinsic motivation, the adoption of self-leadership strategies can be motivated by the desire to obtain certain external organizational rewards (external motivation), by the belief that these strategies will help employees achieve their goals (identified motivation) or because these proactive behaviors are in agreement with their values and beliefs (integrated motivation). In terms of intrinsic motivation, SDT suggests that when employees use behavioral strategies, they will satisfy their need for autonomy and then the need for competence. The satisfaction of these psychological needs would later lead to greater work engagement and higher performance. In other words, employees who set their own goals, adjust their behavior through their own self-correcting feedback, and reward themselves when they achieve their goals will feel more autonomous at work and more in control of the tasks they have to perform. In the end, satisfying the two needs (for autonomy and competence) will increase engagement and performance. In line with this theoretical assumption, work engagement mediates the link between self-leadership and both job performance (Inam et al., 2021) and individual innovation (Gomes, Curral, & Caetano, 2015). In a diary study (Breevaart et al., 2016), weekly self-leadership was positively associated with weekly performance, the relationship being explained by weekly work engagement.

Also, previous studies support the positive link between self-leadership and behaviors related to contextual performance, such as working together with colleagues to achieve results, sharing information with team members, and coordinating one's behavior to increase synchronization with the team (Hauschildt & Konradt, 2012). Taken together, we expect positive links between self-leadership and all three types of performance.

Hypothesis 1. Self-leadership is positively related to task performance, contextual performance, and creative performance.

The Mediating Role of Job Crafting

Based on SDT (Deci & Ryan, 1985; Ryan & Deci, 2000), we expect the link between self-leadership and job performance to be explained by job crafting. Job crafting is defined as a set of initiatives through which employees change certain aspects of their jobs (Tims, Twemlow, & Fong, 2022). The resources-based approach of job crafting operationalizes the construct through four factors: (1) increasing structural job resources

(e.g., seeking autonomy and opportunities for development), (2) increasing social job resources (e.g., seeking coaching and advice from colleagues and supervisors), (3) increasing challenging job demands (e.g., looking for more tasks or responsibilities), and (4) decreasing hindering job demands (e.g., reducing cognitive or emotional demands) (Tims, Bakker, & Derks, 2012). From the perspective of external motivation from SDT (Deci & Ryan, 1985; Ryan & Deci, 2000), employees will seek to craft their job in order to increase their chances to perform and, therefore, to receive organizational rewards (external motivation), to achieve their organizational objectives (identified motivation) or because their personal values are in accordance with these job crafting behaviors (integrated motivation).

Regarding intrinsic motivation, according to SDT, when they lead themselves, employees will be motivated to satisfy their three basic psychological needs. They will seek to satisfy their need for autonomy by changing their job so that they can make more decisions on their own (i.e., increasing structural resources). Employees will self-regulate their social behavior to satisfy their need for relatedness by seeking feedback and support and by avoiding difficult colleagues (i.e., increasing social resources and decreasing hindering demands). For example, when the manager is absent or does not get involved in the development of subordinates, employees can take the initiative and ask the leader directly to provide them with opportunities for development, feedback or suggestions for improving performance. In other situations, employees can manage their work among themselves, even if the direct supervisor does not assume the responsibilities of a leader, by seeking mutual support within the team. Therefore, by crafting social resources, employees can perform even when managers have poor leadership styles, because they can proactively ask them to focus on team development or they can actively seek mutual support within the team. Finally, the need for competence can be satisfied by looking for professional development opportunities, new projects or the use of new technologies in the workplace (i.e., increasing structural resources and challenging demands). These changes in job characteristics can be achieved through self-leadership strategies such as envisioning a workplace that is richer in resources and challenges, establishing objectives to craft the jobs, and by changing the tasks in order to be more rewarding. These strategies can lead to proactive behaviors that change certain aspects of work.

Moreover, self-leadership is associated with proactivity at work (Hauschildt & Konradt, 2012), including innovative behaviors (Carmeli, Meitar, & Weisberg, 2006) and work role innovation (Curral & Marques-Quinteiro, 2009). Given that job crafting also represents a set of proactive behaviors in the workplace, we expect positive associations with self-leadership. Indeed, previous studies have found a positive relationship between self-leadership and job crafting (Costantini & Weintraub, 2022; Liu, Peng, & Wen, 2023). At the same time, the meta-analytical data suggest a positive association between job crafting and both in-role and contextual performance (Rudolph, Katz, Lavigne, & Zacher, 2017) and that job crafting interventions have positive effects on these two types of performance (Oprea, Barzin, Vîrgă, Iliescu, & Rusu, 2019). In conclusion, we expect employees high in self-leadership to craft their jobs more, which in turn will lead to a higher performance. The expected relationships are presented in Figure 1.

Hypothesis 2. Job crafting mediates the positive relationship between self-leadership and performance.

Methods

Participants and Procedure

A total of 282 employees from a company that provides water and sewerage services (49.29% female) were included in the study, with age between 20 and 68 years (M = 45.51 years, SD = 11.04 years). 40.07% of the participants had over 10 years of experience in the company, 19.86% between 3 and 5 years, 15.96% between 5 and 10 years, and 12.41% between 1 and 3 years. Just 10.99% had between 0 and one year of experience in the company, and .35% between 1 and 3 years or over 10 years

of experience. A non-experimental, cross-sectional study was conducted on a Romanian company, the employees completed the questionnaires during a periodical assessment. The participants were briefed and informed that data were confidential and the participation in the study was voluntary.

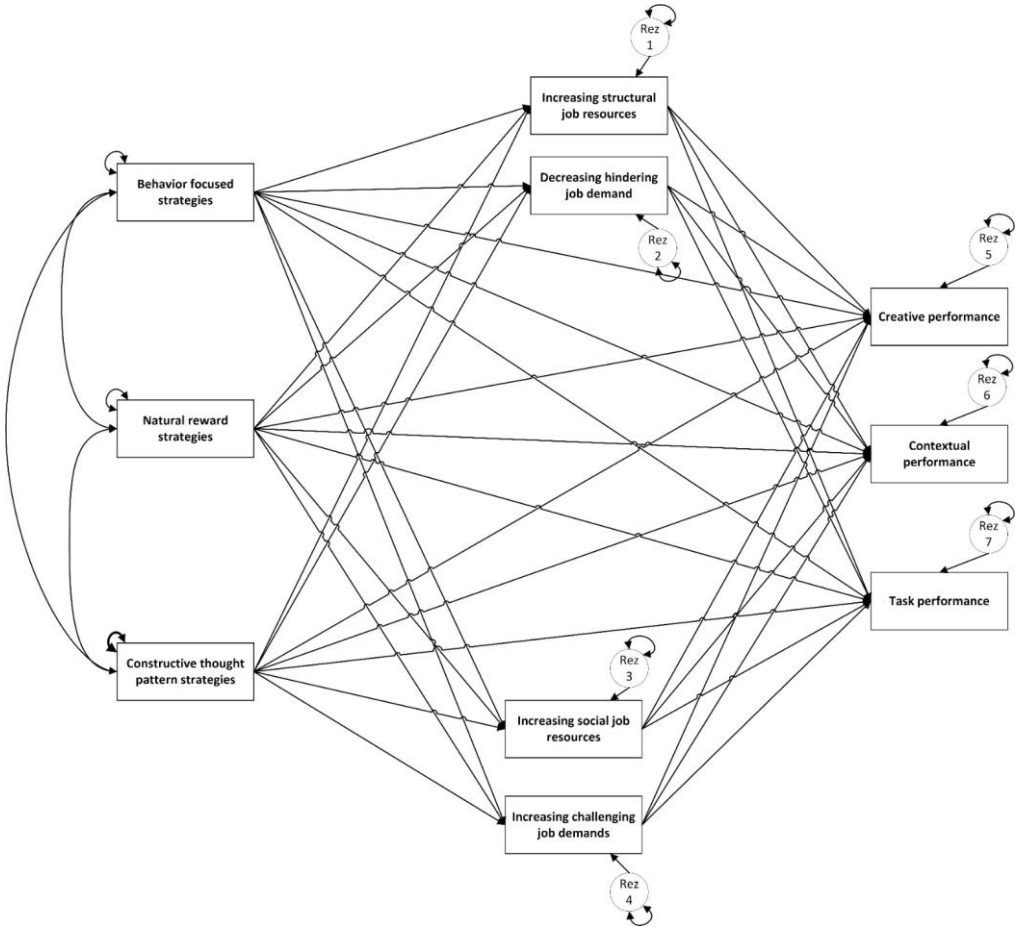

Figure 1. The proposed research model

Measurements

Self-leadership was assessed with the Revised Self-Leadership Questionnaire (Houghton & Neck, 2002), a 35-items (e.g., *"I use my imagination to picture myself performing well on important tasks."*) inventory with 3 factors: behavior focused strategies (α = .92), natural reward strategies (α = .78), and constructive thought pattern strategies (α = .87). The internal consistency indicators in parentheses were calculated based on the sample of this study for all the measurements used.

Task performance was measured with nine items (e.g., *"You achieve the objectives of your job."*) from Goodman & Svyantek's Performance Scale (Goodman & Svyantek, 1999), α = .85. *Contextual performance* was measured with seven items (e.g., *"You assist your colleagues with their duties."*) from Goodman & Svyantek's Performance Scale (Goodman & Svyantek, 1999), α = .81. *Creative performance* was measured with three items on a 7-points scale (e.g., *"How creative is your work? Creativity refers to the extent to which the employee develops ideas,*

methods, or products that are both original and useful to the organization.") (Oldham & Cummings, 1996), α = .92.

Job crafting was measured with Job Crafting Scale (Tims, Bakker, & Derks, 2012; Oprea & Ștefan, 2015), a questionnaire with 4 factors: increasing structural job resources (5 items, e.g., *"I try to develop my capabilities."*, α = .66), decreasing hindering job demands (6 items, e.g., *"I make sure that my work is mentally less intense."*, α = .86), increasing social job resources (6 items, e.g., *"I ask my supervisor to coach me."*, α = .76), and increasing challenging job demands (5 items, e.g., *"When an interesting project comes along, I offer myself proactively as project co-worker."*, α = .85).

Statistical Approach

We used R version 4.2.2 (R Core Team, 2022) and the R-packages dplyr version 1.1.0 (Wickham, François, Henry, & Müller, 2022), kableExtra version 1.3.4 (Zhu, 2021), mvtnorm version 1.1.3 (Genz & Bretz, 2009), naniar version 1.0.0 (Tierney, Cook, McBain, & Fay, 2021), papaja version 0.1.1 (Aust & Barth, 2022), psych version 2.2.9 (Revelle, 2022), readxl version 1.4.1 (Wickham & Bryan, 2022), rstatix version 0.7.2 (Kassambara, 2022), sasLM version 0.9.5 (Bae, 2022), and tinylabels version 0.2.3 (Barth, 2022) for all our analyses. The initial assumptions assessment was conducted using a descriptive univariate analysis. Data screening for outliers and missing cases analysis were conducted to verify univariate normality and Mardia indicator was computed to assess multivariate normality. Internal consistency was assessed using α Cronbach indicator and a path model analysis based on MLMVS (Maximum Likelihood with Mean and Variance Scaled) was used to test the mediation hypothesis.

Results

An initial descriptive analysis was performed, showing that the assumption of univariate normality was not met for the study variables. Results suggested that Natural reward strategies and Creative performance were left skewed, and Task performance, Increasing structural job resources, Decreasing hindering job demands, and Increasing social job resources were right skewed. Leptokurtic distributions were observed for Behavior focused strategies, Task performance, and Increasing structural job resources. Platikurtic distributions were observed for Creative performance and Increasing social job resources. Most of the Spearman's ρ correlations were statistically significant (see Table 1) with values between -.07 and .84, and the correlation matrix was positively defined (det =.01). Result were in line with Hypothesis 1.

We further analyzed the proposed research model, and convergence was acquired after 85 iterations, estimating 53 parameters, based on 279 data (3 missing cases were removed) and resulting good fit indices ($\chi 2$ = 2.06, *df* = 2, *p* = .336, *CFI* = 1, *SRMR* = .01, *RMSEA* = .02, *p* = .53, 90% *CI* [0, .12]) without relevant modification indices (see Fig. 2). Our data suggested, under the assumption of mediator's residuals correlations, only a direct effect of natural reward strategies on creative performance (*B* = .18, *z* = 2.76, *p* = .006, β = .22), contextual performance (*B* = .15, *z* = 3.34, *p* = .001, β = .23), and task performance. Furthermore, on the first mediating path, increasing structural resources was positively influenced by behavior focused strategies (*B* = .14, *z* = 5.59, *p* < .001, β = .63) and negatively by constructive thought pattern strategies (*B* = -.09, *z* = -3.36, *p* = .001, β = -.30); decreasing hindering demands was positively influenced by natural reward strategies (*B* = .30, *z* = 2.83, *p* = .005, β = .25) and constructive thought pattern strategies (*B* = .12, *z* = 2.09, *p* = .037, β = .24); increasing social resources was positively influenced only by behavior focused strategies (*B* = .09, *z* = 1.16, *p* = .247, β = .10); increasing challenging demand was positively influenced only by behavior focused strategies (*B* = .14, *z* = 4.51, *p* < .001, β = .44).

Table 1. *Means, Standard Deviations, and Correlations Among Study Variables*

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Behavior focused strategies	60.89	14.71									
2. Natural reward strategies	16.60	4.55	.72***								
3. Constructive thought pattern strategies	36.13	10.31	.84***	.67***							
4. Increasing structural resources	20.71	4.26	.35***	.24***	.21***						
5. Decreasing hindering demands	13.07	5.36	.20***	.25***	.25***	-.07					
6. Increasing social resources	12.36	3.95	.45***	.36***	.37***	.17**	.38***				
7. Increasing challenging demands	14.77	4.64	.51***	.42***	.44***	.42***	.19***	.50***			
8. Task performance	30.01	4.22	.49***	.45***	.37***	.51***	.03	.26***	.52***		
9. Contextual performance	22.44	3.05	.51***	.47***	.38***	.49***	.07	.33***	.62***	.74***	
10. Creative performance	15.27	3.75	.47***	.43***	.42***	.35***	.13*	.25***	.45***	.61***	.52***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

On the second mediating path, creative performance was positively associated with increasing structural resources (B = .23, z = 2.98, p = .003, β = .19) and increasing challenging demands (B = .20, z = 4.03, $p < .001$, β = .25); contextual performance was positively associated with increasing structural resources (B = .28, z = 4.82, $p < .001$, β = .29) and increasing challenging demands (B = .29, z = 8.00, $p < .001$, β = 43); task performance was positively associated with increasing structural demands (B = .49, z = 5.65, $p < .001$, β = .39) and increasing challenging demands (B = .22, z = 4.62, $p < .001$, β = .26).

Creative performance (R^2 = .36) was best explained by three direct effects of natural reward strategies (B = .18, z = 2.76, p = .006, β = .22), increasing structural resources (B = .23, z = 2.98, p = 0.003, β = .19), and increasing challenging demands (B = .20, z = 4.03, $p < .001$, β = .25) and three indirect effects. The effect of behavior focused strategies on creative performance was completely mediated by increasing structural resources (B = .03, z = 2.65, p = .008, β = .12) and increasing challenging demands (B = .03, z = 3.15, p = .002, β = .11) and the effect of constructive thought pattern strategies on creative performance was completely mediated by increasing structural resources (B = -.02, z = -2.18, p = .029, β = -.06).

Contextual performance (R^2 = .53) was best explained by three direct effects of natural reward strategies (B = .15, z = 3.34, p = .001, β = .23), increasing structural resources (B = .28, z = 4.82, $p < .001$, β = .29), and increasing challenging demands (B = .29, z = 8.00, $p < .001$, β = .43) and three indirect effects. The effect of behavior focused strategies on contextual performance was completely mediated by increasing structural resources (B = .04, z = 3.76, $p < .001$, β = 0.18) and increasing challenging demands (B = .04, z = 3.97, $p < .001$, β = .19) and the effect of constructive thought pattern strategies on

contextual performance was completely mediated by increasing structural resources (B = -.02, z = -2.64, p = .008, β = -.08).

Task performance (R^2 = .49) was best explained by two direct effects of increasing structural resources (B = .49, z = 5.65, p < .001, β = .39) and increasing challenging demands (B = .22, z = 4.62, p < .001, β = .26) and by three indirect effects. The effect of behavior focused strategies on task performance was completely mediated by increasing structural resources (B = .07, z = 3.80, p < .001, β = .24) and increasing challenging demands (B = .03, z = 3.16, p = .002, β = .11) and the effect of constructive thought pattern strategies on task performance was completely mediated by increasing structural resources (B = -.04, z = -2.72, p = .006, β = -.11).

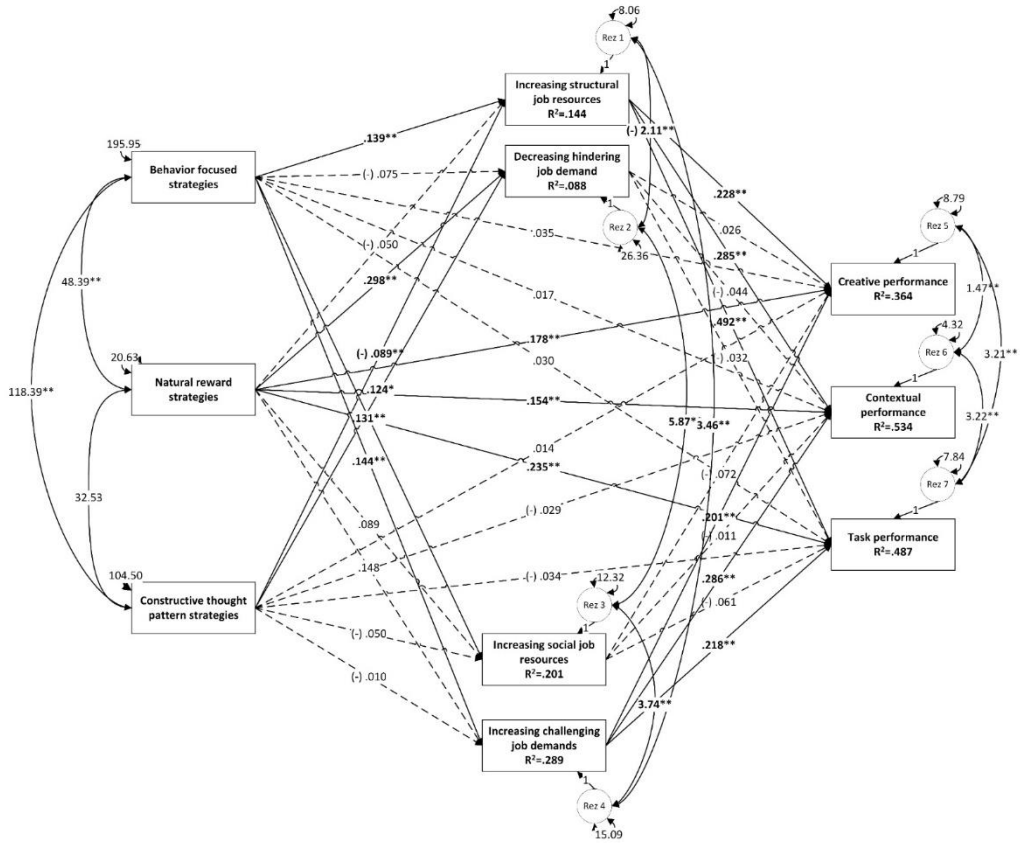

Figure 2. Estimates for the relationships between self-leadership, job crafting, and performance

Discussion

The purpose of this study was to test the mediating role of job crafting in the relationship between self-leadership and three types of performance: task, contextual, and creative performance. As we expected, self-leadership was positively related to task performance. This result is in line with previous findings (Breevaart et al., 2016; Panagopoulos & Ogilvie, 2015; Prussia et al., 1998). We found positive links between self-leadership components and contextual performance. Although previous studies did not directly analyze the relationship with contextual performance, this finding is in accordance to previous results that indicate a positive association between self-leadership and team member proficiency, representing task-related collaborative behaviors such as information exchange, coordination, and cooperation (Hauschildt & Konradt, 2012).

In line with previous meta-analytical findings (Knotts et al., 2022), our results indicated a positive link between self-leadership and creative performance. All three self-leadership strategies were associated with job crafting. This result is in line with previous findings. Employees who use self-leadership strategies are more proactive, meaning that they initiate more changes at both individual and team level (Hauschildt & Konradt, 2012). Also, self-leadership and job crafting were positively related in recently published papers (Costantini & Weintraub, 2022; Liu, Peng, & Wen, 2023).

Theoretical and Practical Implications

This study has two important theoretical implications. First of all, the results of the study can explain why in certain situations employees can perform even if the organization has ineffective or absent leadership. The scientific literature on performance has brought significant evidence showing that certain leadership styles (e.g., transformational, transactional) are positively associated with performance and certain styles (e.g., abusive) are negatively associated with followers' performance. However, sometimes employees can have a high performance despite ineffective or absent leaders, and the current study suggests that this phenomenon can occur when employees adopt self-leadership strategies. Secondly, the current study offers an additional explanatory mechanism in the relationship between self-leadership and the three types of performance. Until now, based on control theory (Carver & Scheier 1982), social cognitive theory (Bandura, 1986), and SDT (Deci and Ryan, 1985; Ryan & Deci, 2000), two mediators have been highlighted in the relationship between self-leadership and performance: self-efficacy (Panagopoulos & Ogilvie, 2015; Prussia et al., 1998) and work engagement (Breevaart et al., 2016; Inam et al., 2021; Gomes et al., 2015). Our study advances the understanding of the mechanisms through which self-leadership leads to performance by identifying job crafting as another mediator. However, the present study was conducted in a single organization from a specific industry. To be able to generalize this mediation relationship, this explanatory mechanism should be replicated in other studies with heterogeneous samples or in studies with organizations from other fields.

From a practical point of view, our results indicate that organizations can use self-leadership interventions in order to stimulate employees' job crafting behaviors and job performance. Interventions that teach people to be their own leaders have already been tested and have led to positive results. For example, employees trained in thought self-leadership (i.e., ways in which they can use cognitive strategies such as self-talk and mental imagery to manage their own behavior) experience increases in mental performance, enthusiasm, and job satisfaction and decreases in nervousness (Neck & Manz, 1996). For health care professionals, self-leadership training increased both work engagement and performance. Positive results of self-leadership interventions were identified even in military settings; soldiers who participated in a self-leadership training had a higher performance, measured by examination marks and physical tests (e.g., obstacle course), compared to a control group (Lucke & Furtner, 2015). Moreover, studies suggest that self-leadership interventions could have a higher impact on the most problematic employees from organizations (e.g., employees with low conscientiousness). Employees with low conscientiousness tend to engage less in job crafting behaviors (Oprea et al., 2019) and to have a lower performance (Barrick & Mount, 1991). Previous findings suggest that self-leadership interventions have an effect especially on employees that are low in conscientiousness (Stewart, Carson, & Cardy, 1996). Therefore, self-leadership interventions could be a solution to manage employees who are less likely to be proactive and to perform well. An advantage of self-leadership interventions is that they can be successfully applied online, in the form of self-help exercises (Unsworth & Mason, 2012), which makes such interventions available for a large number of employees cheaply and from anywhere.

Limitations and Future Directions

As with any research, the present study has a number of limitations. First of all, the study is cross-sectional, therefore longitudinal studies are needed in order to draw causal conclusions. The relationships studied in the current research could be analyzed in the future using measurements at several time intervals (e.g., a three-wave design). Thus, the causal effect of self-leadership on performance can be properly investigated. Second, all measurements were made with self-report questionnaires, increasing the risk for common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In future studies, data should be collected using measurements from multiple sources (e.g., objective measurements of performance, evaluations from supervisors or colleagues for performance and job crafting). Thirdly, the relationships between self-leadership and different outcomes are moderated by a series of variables, such as organizational-based self-esteem (Panagopoulos & Ogilvie, 2015) and collectivism (Hauschildt & Konradt, 2012). Future studies could explore the role of certain moderators in the relationship between self-leadership and both job crafting and performance. Fourthly, the sample consisted of employees from a single organization. Variables specific to this company (e.g., organizational culture & climate, corporate strategy, specific organizational goals, preferred employee profiles, specific skill structure) could influence the results of the study. Therefore, we cannot generalize the results to other types of industries. Future studies could use more heterogeneous samples in terms of participants' occupations. Finally, although we proposed self-leadership interventions as a possible solution for increasing job crafting behaviors and performance, the studies in which such interventions were tested did not include job crafting as an outcome. Future studies could test whether employees trained in self-leadership craft their job more.

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RESEARCH ARTICLE

Decision-making style, personality, and decision outcomes of military personnel, a network analysis approach

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Abstract

Research on decision-making often relies on controlled laboratory studies, which are de-tached from real-life scenarios. Analyzing self-reported, long-term decision outcomes from a military real-world contexts can provide a robust foundation for identifying individual factors that differentiate decision-making capabilities among individuals. The role of per-sonality factors and decision-making styles is analyzed in the decision-making process, us-ing the Decision Outcomes Inventory (DOI), developed by Bruine de Bruine et al. in a sam-ple of the population of 178 active militaries, of which 135 men and 39 women. The results of the decision-making process are significantly predicted by the anxious decision-making style, i.e., people who tend to experience negative feelings during decision-making end up having better results when making decisions. The strong link between the anxious decision-making style and emotional stability is highlighted by the structure of the network used in the analysis. Since the opposite pole of emotional stability is neuroticism, we can say that people with an anxious decision-making style face a wide range of feelings specific to this decision-making style, such as fear, and insecurity, so they postpone deciding until they find the best solution.

Keywords

decision styles, Big Five model, decision-making outcomes inventory, network analysis

This study, like most decision-making research, aims to understand how people make decisions, with the ultimate goal of finding solutions to improve them.

Three factors strongly influence decision-making quality: the nature of the decision, the situation in which the decision is made, and the characteristics of the decision-maker (Einhorn, 1970). The influence of the characteristics of the decision-maker has primarily been investigated in normative decision-making performance and hence has aimed to assess the characteristics that predict compliance with the normative decision-making principles derived from theoretical models (e.g. Expected utility theory).

However, examination of real-world decision outcomes is rare because most research uses laboratory designs deliberately isolated from everyday decisions (Parker et al., 2015). The analysis of the past decision-making results of the subjects, self-reported, over several years, can constitute a solid basis for highlighting those individual factors that make the difference between individuals.

Research on decision-making styles indicates five different but non-mutually exclusive styles used by the military to make

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decisions (Scott & Bruce, 1995; Thunholm, 2004), and individuals generally have different levels of all five styles, although one style is usually dominant (Allwood & Salo, 2012)

The purpose of this study was to investigate which of the individual decision-making styles used by the military lead to positive decision-making outcomes in their daily lives.

The need for the military to make the best decisions on the battlefield is obvious, to find the best training methods, it is necessary to analyze their past decision-making outcomes and the decision-making styles used.

Decision-making style

The decision-making style has been defined as "a model that individuals typically use in decision-making" (Dewberry et al., 2013) and as a "learned, common response model presented by a person when confronted with a decision situation" (Scott & Bruce, 1995). Decision-making styles are associated with multiple outcomes in many aspects of daily life (Bruine de Bruin et al., 2007) and impact many areas of life (Bakewell & Mitchell, 2003; Patton et al., 2004; Venkatesh et al., 2000).

Behavioral-oriented psychologists have labeled these individual patterns of interpretation and response in decision-making tasks as decision-making styles (Driver et al., 2006). Driver and his colleagues demonstrated that a senior manager's style and decision-making profile are mainly in contrast to the decision-making style of managers who are at entry-level management.

The decision-making style questionnaire was developed by Leykin and DeRubeis (2010); based on the tools developed by Mann (1998), Turner and his colleagues (2012), and Scott & Bruce (1995). The inventory contains nine scales divided into two categories: the first, evaluates the individual's perception of himself as a decision-maker, with the scales *confident* and *respected*, and the second category evaluates seven decision styles, as follows: *intuitive* (use of intuition in decisions), *spontaneous* (tendency to make quick decisions), *vigilant* (thorough analysis of all possible options), *dependent* (seeking advice and trusting other people to make decisions), *avoidant* (tendency to avoid decision-making situations), *brooding* (involves feelings of post-decision regret), *anxious* (expresses a tendency to experience negative emotions during the decision).

The two information processing systems involved in decision-making are *system 1*, which is intuitive, automatic, associative, fast, heuristic, and involves parallel processing, and *system 2*, which is analytical, explicit, rule-based, relatively slow, and involves sequential processing (Pacini & Epstein, 1999; Stanovich & West, 1998). Based on this theory, intuitive and spontaneous decision styles belong to *system 1*, and the vigilant decision style belongs to *system 2*. The last four styles, *dependent*, *avoidant*, *brooding*, and *anxious*, are conceptually distinct from the perspective of the two processing systems of information. The first three styles, dependent, avoidant, and brooding, can be interpreted instead as *processes related to decision regulation*: the degree of procrastination in decision-making (avoidant style), the appearance of feelings of post-decision regret (brooding style), and the search for advice from other people (dependent style). The fourth style expresses the tendency *to experience negative feelings during decision-making* (anxious style). Unlike basic decision-making styles: intuitive, vigilant, and spontaneous, avoidance, brooding, dependent, and anxious decision-making styles are also important in decision-making, because they are related to the regulation of the decision-making process rather than which is the decision.

Decision-making competence

Decision-making competence is measured in a variety of ways. Sometimes, the intention is to examine the quality of decisions in a specific area, such as prescribing medical treatment according to a particular medical condition (Hagger et al., 2010).

The second group of tools refers to the ability to perform in a normative way some aspects of the decision-making process, such as the correct calibration of confidence or resistance to the framing effects (Bruin et al., 2007).

A third approach to assessing decision-making competence is to examine the extent to which people have experienced a wide range of unwanted decision-making outcomes in everyday life. The Decision Outcomes Inventory (DOI) (Bruin et al., 2007) is a self-reported questionnaire in which people indicate whether they have experienced 34 everyday negative events. A strong point of DOI is that it reflects the frequency with which people have avoided the (negative) results of a wide range of daily decisions over an extended period. Research indicates that performance on DOI is positively associated with higher socioeconomic status, younger age, and a variety of decision styles, including the tendency to decide rationally and intuitively. Bruine de Bruin and collaborateurs (2007) established that decision-making styles predict decision-making competence.

Hypothesis 1. Intuitive and spontaneous decision-making styles lead to low decision-making outcomes.

Personality and decision-making

Personality is one of the determining indicators of a decision-making style (García-Gallego et al., 2017) and is based on the personality theory, i.e., the assumption that an individual's behavior influences the way he thinks, perceives, and evaluates the environment (Martin, 1997). Personality traits can be conceptualized as a set of predispositions to act in the same way in various situations. There are different models of personality traits, of which the five-factor model, often called the Big Five, is a widely accepted and popular model for embodying individual personality differences (Wang et al., 2017). Within this model, most personality differences can be summarized in five stable dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience.

Extraversion is characterized by a tendency to be self-confident, dominant, active, and seeking enthusiasm. Extroverts show positive emotions, a higher frequency and intensity of personal interactions, and a greater need for stimulation (Bakker et al., 2006). Moreover, Extraversion describes the extent to which individuals are assertive, active, enthusiastic, talkative, warm, energetic, and dominant (Costa & McCrae, 1992).

Agreeableness is characterized by cooperation (trust in others and care) and sympathy. Agreeable people tend to show up and are more likely to experience happiness because they enjoy love to have close relationships, and those with high scores on this trait will also have greater life satisfaction (Costa & McCrae, 1992).

Conscientiousness is characterized by the fact that the person is hardworking, persistent, well-organized, orderly, responsible, reliable, and goal-oriented (Costa & McCrae, 1992). Costa and McCrae (1992) associated conscientiousness with self-discipline, achievement, respect, and competence. The persistence and self-discipline of the conscientious individual will also facilitate him in completing tasks on time (Bakker et al., 2006).

Neuroticism is characterized by anger and is the opposite of emotional stability. People with a high level of neuroticism are insecure, anxious, and more susceptible to stress than their low-neurotic counterparts (Costa & McCrae, 1992). They experience higher levels of negative affect, are slightly irritated by others, and are more likely to resort to inappropriate coping responses, such as interpersonal hostility. Neuroticism also embodies the degree to which one is tense, sensitive, unstable, worrying, and anxious. As opposed to extraversion, a person with a high level of neuroticism is prone to be affected by negative events. An extremely neurotic person tends to experience negative emotions, such as anxiety, depression, impulsivity, nervousness, and underestimating their performance. In contrast, less neurotic individuals tend to exhibit confident behavior (Bakker et al., 2006).

Openness to experience is characterized by a tendency to have an active imagination, an intellectual curiosity, and a willingness to consider new ideas and try new things (Costa & McCrae, 1992). Furthermore, openness to experience is defined by originality, curiosity, and ingenuity. Openness to experience refers

to an individual's desire to be cultured and to explore new encounters. More open people are usually creative, imaginative, curious, impulsive, and insightful. Less open people tend to be more narrow-minded (Berglund et al., 2015).

There are many types of research on the role of personality dimensions in decision-making styles (Bayram & Aydemir, 2017). As a result, personality traits have an important effect on the type of decision-making styles. For this reason, this study is based on contribution to the theory development in terms of the role of big five personality traits in decision-making styles with a Romanian military sample.

Hypothesis no. 2. Conscientiousness (positive), and neuroticism (negative) will predict the quality of decision results.

Research Overview

This study investigates the relationships between personality traits, decision-making styles as predictors, and the results of everyday decisions as a dependent variable. The military environment is characterized by many situations in which personnel are forced to make decisions. Their decision-making style is essential for periodic evaluation of indicators such as morale or organizational climate. The specificity of this environment is that it has many restrictions regarding the military's behavior in society. Negative outcomes in everyday life that occur because of bad decisions (e.g., a car accident under the influence of alcohol) can negatively affect their careers. As a result, it is necessary to identify the constructs that can predict these negative results and, at the same time, to find ways to intervene to prevent them.

Method

Participants

The hypotheses of the study were verified on a sample of 179 military employed in two garrisons in Bucharest city, and they have an average age of 32.61 years (*SD* = 7.64, *SEM* = 0.58, *Min* = 19.00, *Max* = 52.00, Skewness = 0.65, Kurtosis = -0.09, Mode = 30.00, Mdn = 30.50). Descriptive statistics for demographic variables of gender, military status, marital status, and type of position held are presented in the following table.

Table 1. *Descriptive Statistics*

Variables	*n*	*%*
Gender		
0 - women	39	22.41
1 - men	135	77.59
Military category		
1 - officers	44	25.29
2 - non-commissioned officers	67	38.51
3 - soldiers	63	36.21
Family status		
0 - unmarried	85	48.85
1 - married	89	51.15
Type of position held		
0 - execution	145	83.33
1 - command	29	16.67

Instruments

All instruments used in this study are self-report questionnaires with Likert-type scales. Decision-making styles were assessed using the Decision Style Inventory (DSQ) developed by Leykin and DeRubeis (2011) which consists of 43 items. The DSQ contains nine scales divided into two categories: the first, which assesses the individual's perception of the decision-maker, with *confident* and *respected* scales, and the second, which evaluates seven types of decision-making styles as follows: *intuitive, spontaneous, vigilant, dependent, avoidant, anxious, and brooding.* Confident (DSQ_Con), 5 items, example item:*I feel confident about my ability to make decisions*, Cronbach's alpha = .81. Respected (DBQ_Res), 2 items, example item: *My friends or family seek my advice when they have to make important decisions*, Cronbach's alpha = .79. Intuitive (DSQ_Int), 5 items, example item:*When I make decisions, I tend to rely on my intuition*, Cronbach's alpha = .83. Spontaneous (DBQ_Spo), 4 items, example item:*I make impulsive decisions*, Cronbach's alpha = .62. Vigilant (DBQ_Vig), 6 items, example item:*I like to consider all the alternatives*, Cronbach's alpha = .90. Dependent (DBQ_Dep), 6 items, example item: *I need the assistance of other people when making important decisions*, Cronbach's alpha = .77. Anxious (DBQ_Anx) 5 items, for example, item: *I feel very anxious when I need to make a decision*, Cronbach's alpha = .86. Brooding (DBQ_Bro), 5 items, example item: *I think about all the bad decisions I have made in my life*, Cronbach's alpha = .58. Avoidant (DBQ_Avo), 5 items, example item: *I postpone decision-making whenever possible*, Cronbach's alpha = .76.

Personality was assessed using the CP5F personality questionnaire developed by Monica Albu (Albu, 2008; Miclea et al., 2009) after the FFPI (Five-Factor Personality Inventory) (Hendriks, 1997). The CP5F questionnaire is intended to evaluate the five super factors of the Big Five model (Extraversion, Emotional Stability, Conscientiousness, Openness, and Autonomy). It contains six scales: one for each model factor (whose name coincides with that of the area it measures) and a scale (called Social Desirability) for identifying people whose answers do not conform to reality, either because they want to create a favorable image, either because they respond at random, or they want to appear different from the rest of the people. The CP5F questionnaire contains 130 items, grouped into six scales: *Extraversion* (E), 23 items; *high score*: feels good in society, participates actively in fun, or likes to talk, *low score*: the subject is isolated from others, is silent. Cronbach's alpha = .89. *Openness* (O): 24 items, *high score*: shows interest in those around, respects the opinions and rights of others, and tries to be on good terms with others. Cronbach's alpha = .86. *Conscientiousness* (C): 25 items, *high score*: respects the rules and regulations, is an organized person, and plans for the actions. They strive to do everything right and is a reliable person. With a *low score*: they a non-conformists and start actions without thinking about what they serve and how they will end. It does not respect the set deadlines. Cronbach's alpha = .87. *Emotional Stability* (N): 21 items, *high score*: thinks positively, is optimistic, controls their emotions, and has confidence in their strength, *low score*: worries about everything, is always anxious, and in stressful situations, they get lost. Cronbach's alpha = .91. *Autonomy* (A): 22 items, *high score*: acts differently than the others, is creative, *low score*: he/she has no opinion of their own, accepts whatever he/she is told, and can be easily handled. Cronbach's alpha = .66. *Social desirability* (SD): 15 items, Cronbach's alpha = .75.

Each item in the CP5F questionnaire contains a statement about how a person feels (for example: I am troubled by unpleasant events, even though I know that they are unimportant.), he thinks (for example: I consider life to be full of things interesting) or acts (for example: I avoid conducting collective activities.). The subject must appreciate to what extent the statement in each item suits them and answer with one of the variants: 1 = it suits me very little, 2 = it suits

me a little, 3 = fits me about half, 4 = suits me well and 5 = suits me very much.

Decision-making competence was assessed with the *decision outcome inventory* (DOI) (Bruin et al., 2007). Some elements of the original version have been adapted for Romanian-specific language; for example, *dollars* has been replaced by *lei*, and *having a DUI* has been replaced by *fine for driving under the influence of alcohol*. Additionally, items irrelevant to the military environment, such as *gas, and electricity were stopped for non-payment, you were imprisoned, you were bankrupt*, or *you were diagnosed with type 2 diabetes*, were removed from the analysis, due to the lack of variance. We calculated the reliability of the scale without these items, and the result is Cronbach's alpha = .63. DOI was scored using the method suggested by Bruine de Bruin et al. (2007) so that higher scores indicate better decision quality.

Procedure

Questionnaires assessing decision-making styles, personality, and decision-making outcomes were administered in a pencil/paper manner in military units, during regular working hours. The average completion time was 35 minutes.

Data were collected following the principles of anonymity and confidentiality, which were explained to the study participants in a cover letter at the beginning of the evaluation. There was also information about the purpose of the study, the authors, their affiliation, and their contact information.

Data Analysis

Descriptive statistics (*M* and *SD*) and Cronbach's alpha coefficients were computed for each scale.

Network analysis is an approach that has its origins in graph theory, a field of mathematics that studies the relationships between objects, which emerged in the eighteenth century. Networks are also rooted in sociology, especially in exploring connections between human beings considering family groups, friends, and co-workers.

To better capture the relationships between the variables used in this study, a weighted undirected network was constructed for all variables as "nodes" using JASP Version 0.18.3 (*JASP Team (2024). JASP (Version 0.18.3)*, 2024). An undirected network was built, where edges between nodes are undirected and indicate some mutual relationship but with no indication of the direction of effect (Hevey, 2018). The nonparametric correlation method was used, where firstly the nonparametric transformation was applied to make all data normally distributed and then Pearson correlations were used.

Overall, the constructed network can be observed as an interconnected partial correlation structure among a set of items (Rhemtulla et al., 2016). The regularized partial correlation network was estimated using graphical LASSO regularization with EBIC model selection (Epskamp et al., 2018). The Fruchterman-Reingold algorithm was used for visualization, where nodes with stronger and/or more connections are placed closer together.

In the evaluation of the network in the case of groups such as command function vs. execution function or with road problems vs. without road problems, we used the partial correlation estimator due to the small number of subjects in one of the groups.

Using this methodology, we can capture a network structure in which nodes represent the variables, while the relationships between the variables, after controlling for all other nodes in the network, are represented by edges. In this way, all interactions between the variables can be visualized and their directions and sizes are visible. Positive relationships are represented using blue borders, while red borders indicate negative relationships. The thickness of the edges is used to show the strength of the associations between the nodes, the thicker edges suggesting a stronger association between the two nodes.

The significance of nodes within a network's structure is often analyzed through centrality indices, which gauge a node's relative importance compared to others based on its connection patterns. These indices, including degree, node strength, closeness, and betweenness centrality, offer insights into various aspects of a node's role in the network. Degree centrality counts direct connections,

while node strength considers both connection quantity and strength. Closeness centrality measures a node's proximity to others in the network, indicating its potential influence or susceptibility to network changes. Betweenness centrality highlights nodes crucial for connecting others and facilitating communication or control flow. These indices provide valuable insights into network structures and functions across different domains. (Hevey, 2018)

The accuracy and stability of the network were examined by bootstrap analysis. The accuracy of the edge weights was examined through bootstrapped (2,500 iterations) 95% confidence intervals (CIs), while the stability of centrality measures indices or node order stability by case-dropping subset bootstrap (proportion of data that could be dropped with 95% probability and still retain a correlation of .70 or higher between the original centrality indices and the centrality of networks based on subsets) (Epskamp et al., 2018).

Result

Correlational analysis

The analysis of the correlations between the analyzed variables is presented in Table 2. Better decision-making outcomes (DOI scale) were moderately associated with high scores on the confidence style scale of individuals' perception of their perspective as decision-makers (r (179) = .25, p <.002). These results suggest that military personnel who have confidence in their ability to make decisions also have good results in making daily decisions. These results remain significant even after controlling for age and gender variables.

The DOI scale was significantly associated with the anxious decision-making style, r (179) = .31, p <.001, which means that people who have negative feelings when they have to make a decision usually also have better results in everyday life. The partial correlation between the DOI scale and the anxiety decision style scale for military with executive functions is significant at an alpha threshold of .05, r = .30, p <.001, 95% *CI* [0.15, 0.45].

Network analysis

The steps to follow in analyzing a network are: (1) estimating the network structure based on a statistical model that reflects the empirical patterns of relationships between variables, (2) analyzing the network structure, and (3) evaluating the accuracy of the network parameters and measures.

Network Structure of variables

The network of DOI, personality, and cognitive decision style is shown in Figure 4, with 48 edges being non-zero out of 120 possible edges.

The estimated network is weighted and undirected, and I used the partial correlation algorithm to analyze it. The results of both the estimated psychological network and the centrality indexes are presented in Figures 4 and Table 3. A node is central if it has many connections, and its centrality depends on strength, closeness, and betweenness (Hevey, 2018). Figure 5 shows the standardized values referring to these three parameters. The indices are all on the same scale of measurement, and they are standardized (z scores), which allows the comparison among them.

From the data analysis in the next table, we can see that conscientiousness and emotional stability have the most significant influence on the network and the most connections activate them by influencing the other nodes. The strongest node is between the anxious decision-making style and emotional stability, the association is negative.

Table 2. *Correlations and Descriptive Statistics for DOI, Decision Style, and Personality Variables.*

Variables	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1. DOI[a]	0.87 (.074)	1															
2. DSQ_Con[b]	4.48 (.483)	.248***	1														
3. DSQ_Res[c]	3.86 (.644)	.090	.437***	1													
4. DSQ_Int[d]	3.35 (.793)	-.091	.210**	.269** *	1												
5. DSQ_Spo[e]	2.67 (.605)	-.177*	-.055	-.059	.422***	1											
6. DSQ_Vig[f]	4.04 (.637)	.136	.354***	.381***	.089	-.232**	1										
7. DSQ_Dep[g]	2.99 (.693)	-.079	-.214***	.166*	-.025	-.026	.137	1									
8. DSQ_Anx[h]	1.72 (.604)	-.307***	-.671***	-.457***	-.252***	.011	-.311***	.204**	1								
9. DSQ_Bro[i]	2.37 (.576)	-.209**	-.277***	.099	.096	.131	.113	.303***	.265***	1							
10. DSQ_Avo[j]	2.06 (.666)	-.046	-.531***	-.379***	-.051	.151	-.263***	.132	.545***	.267***	1						
11. O[k]	98.56 (9.548)	.250**	.414***	.403***	.177*	-.111	.363***	-.121	-.458***	-.025	-.228**	1					
12. N[l]	89.71 (7.938)	.352***	.593***	.439***	.113	-.031	.297***	-.165*	-.712***	-.164*	-.342***	.643***	1				
13. A[m]	77.61 (6.343)	.157*	.379***	.193*	.033	.069	.225**	-.376***	-.371***	.007	-.199**	.261***	.460***	1			
14. E[n]	88.57 (11.563)	.242**	.358***	.322***	.127	.049	.162*	-.075	-.524***	-.056	-.306***	.448***	.660***	.350***	1		
15. C[o]	106.28 (9.378)	.237**	.502***	.398***	.124	-.085	.444***	-.166*	-.505***	-.076	-.285***	.747***	.749***	.436***	.492***	1	
16. S_D[p]	67.08 (5.085)	.295***	.426***	.279***	.051	-.053	.315***	-.181*	-.442***	-.101	-.199**	.716***	.686***	.359***	.425***	.753***	1

N = 174
* *p* <.05*** *p*<.01*** *p*<.001
[a] *Decision outcomes inventory*
[b] *Confident* decision style
[c] *Respected* decision style
[d] *Intuitive* decision style
[e] *Spontaneous* decision style
[f] *Vigilant* decision style
[g] *Dependent* decision style
[h] *Anxious* decision style
[i] *Brooding* decision style
[j] *Avoidant* decision style
[k] *Openness*
[l] *Emotional Stability*
[m] *Autonomy*
[n] *Extraversion*
[o] *Conscientiousness*
[p] *Social desirability*

Table 3. *Centrality measures per variable*

Variable	Network			
	Betweenness	**Closeness**	**Strength**	**Expected influence**
DOI	-.754	-1.062	-1.282	-.557
O	-.593	.487	.434	1.202
N	2.544	1.624	2.225	1.331
A	.694	-.153	-.385	-.411
E	-.754	.380	-.486	.023
C	1.659	1.382	1.434	1.970
S_D	-.754	.585	.345	1.134
Confident	-.754	.493	.757	-.949
Respected	-.191	-.092	.046	.092
Intuitive	-.432	-1.404	-.750	.058
Dependent	-.111	-.861	-.804	-.696
Avoidant	-.513	.093	-.330	-.668
Vigilant	.211	.197	-.588	.058
Spontaneous	-.593	-1.430	-.868	-.242
Anxious	1.096	1.202	1.273	-2.034
Brooding	-.754	-1.441	-1.022	-.311

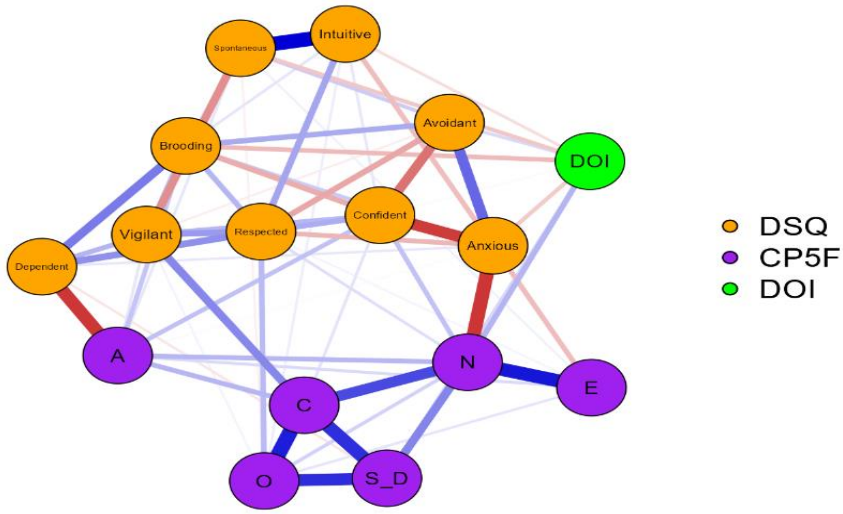

Figure 1. The structure of the network of variables between decision styles, personality, and decision outcomes

Analyzing the network structure

From the perspective of the two information processing systems involved in decision-making, a strong association can be observed between spontaneous and intuitive decision styles specific to system 1. Between spontaneous decision style and vigilant decision style, there is a negative relationship that confirms one of the processing systems' predominant information when subjects decide in everyday life.

The strong link between avoiding decision-making and anxious decision-

making, both in a positive relationship with decision-making outcomes (DOI), shows how postponing a decision or experiencing negative post-decision feelings can lead to good decisions.

Neuroticism and Extraversion are negatively associated with anxious styles of decision-making. Anxious style is a bridge between neuroticism and extraversion, and avoidant style.

From the analysis of how the variables of personality, decision style, and decision-making outcomes are interconnected according to the type of position held, we can say that for *executive functions* (figure 2.1), there is a strong relationship between intuitive and spontaneous decision styles, belonging to the information processing system 1, strong negative associations between the anxious decision-making style and the emotional stability, and between the dependent decision-making style and autonomy.

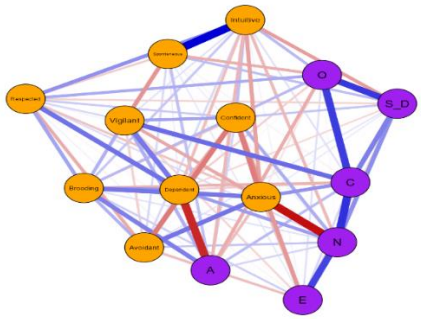

Figure 2.1. Military personnel with execution functions

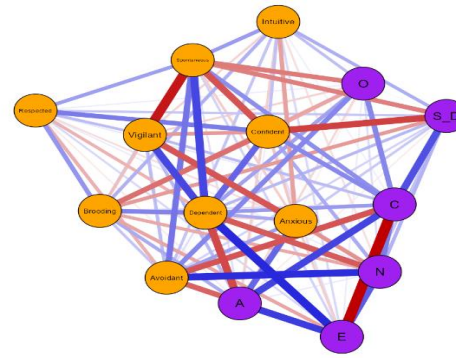

Figure 2.2. Military personnel with command functions

Figure 2. The structure of the network between decision-making styles, personality, and decision outcomes in accord with the type of position.

For command functions (Figure 2.2) there is a solid negative relationship between decision-making results and spontaneous style, vigilant style is also strongly negatively associated with anxious and spontaneous styles, and avoidant is associated positively with the spontaneous style. There is a strong negative association between conscientiousness and extraversion personality traits of military personnel with command functions.

We analyzed how the variables of personality and decision style are interconnected depending on the result of the decisions taken as drivers (item no. 8 - without declared road events vs. with declared road events). From the analysis of the graphs in Figure 3, we can observe the following: the military who reported that they have no road events (Fig. 3.1) are vigilant, do not make decisions spontaneously, take into account the opinion of others, are confident, as decision-makers and do not feel anxiety over making decisions; the military who declared that they had road events (Figure 3.2) although they are vigilant, and make decisions intuitively, spontaneously and when feeling anxiety they avoid making decisions.

Network Stability

The analysis of the stability of centrality estimates shows that the correlation between the order of strength centrality in the full dataset with a dataset in which half of the participants are sampled 2,500 times is above .50 (Figure 3.2). Using 30% of the original sample, the closeness estimate correlates at .70 with the full sample estimate, with strengths at around .80, but betweenness at around .35.

The range from the 2.5th quantile to the 97.5th quantile of all estimates does not drop below 0.25; for closeness and strengths, it is above .50 as recommended (Epskamp et al., 2018). Finding true differences in centrality might require a larger sample size.

Stability analysis indicated that the network is accurately estimated, with moderate confidence intervals around the edge weights (see Figure 4 and Figure 5).

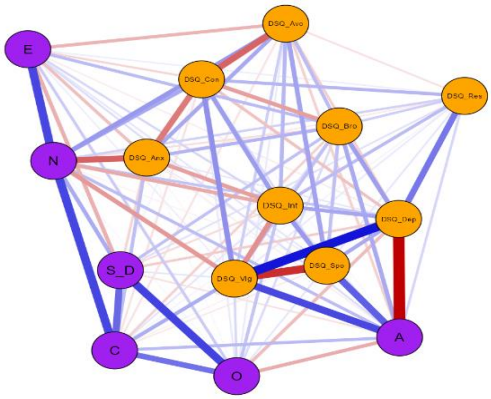

Figure 3.1. The structure of the military network without road events

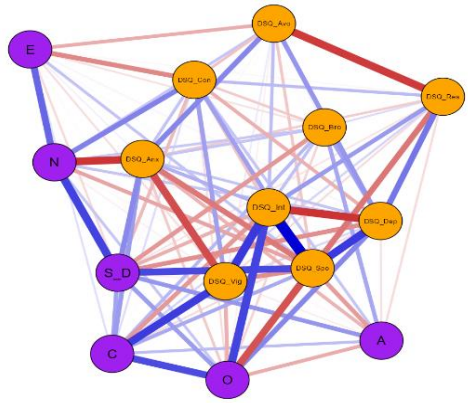

Figure 3.2. The structure of the military network with road events

Figure 3. The network of variables between decision styles, personality, and decision outcomes in military personnel who declared road events vs. without road events.

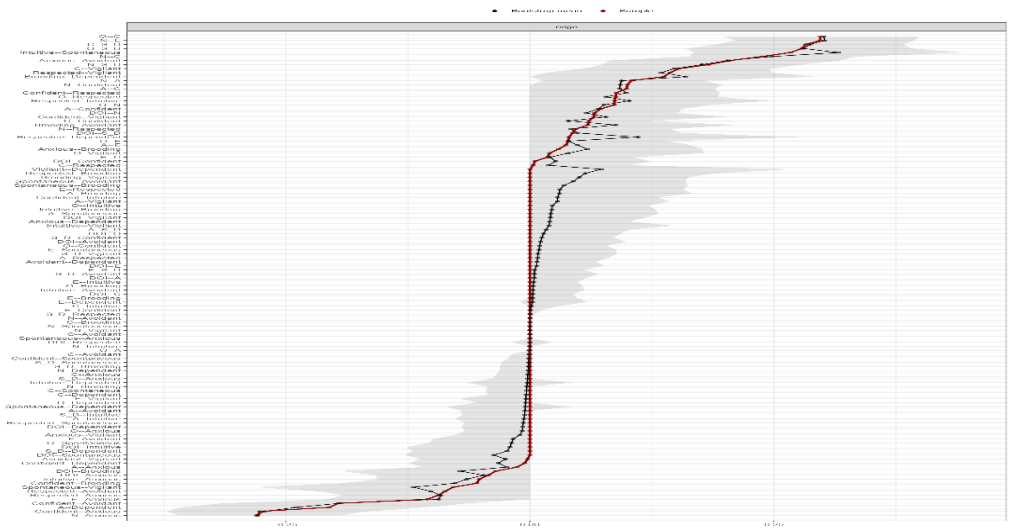

Figure 4. Accuracy of the networks. Bootstrap analysis results of the edge weights

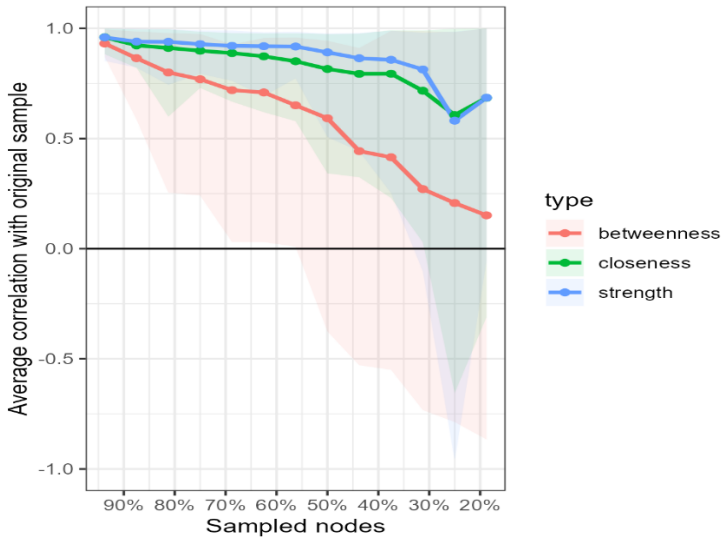

Figure 5. Stability of the networks of centrality indices of the estimated network of the DSQ, CP5F and DOI scales

Note. Figure 5 shows the average correlations between centrality indices of the original sample and networks sampled with case dropping. Lines indicate the means and areas indicate the range from the 2.5th quantile to the 97.5th quantile.

Discussions

The present research had two hypotheses. Our first hypotheses predicted that the Intuitive and spontaneous decision style would be negatively related to the decision outcomes indicators, and our second hypothesis was that conscientiousness (positive), and neuroticism (negative) would also predict the quality of decision results. Results supported both hypotheses in that the correlations and the network analyses showed the expected associations for the Decision outcomes. We used both correlation analysis and network analysis.

The decision-making outcomes are positively associated with the *vigilant* style associated with information processing system 2, which is analytical, rule-based, relatively slow, and with sequential processing. The decision-making styles specific to system 1, intuitive and spontaneous are negatively associated with decision-making results, this signifying the fact that system 1 is frequently used in everyday life, for current and ordinary decisions, and that are also easy to report in a DOI questionnaire type.

For the organizational environment, especially the military, this decision-making profile, specific to people at the base of a career, requires additional training in the decision-making process in the sense of encouraging the use of system 2 thinking, even if it consumes more resources and lasts longer a lot.

Personality is positively associated with decision-making outcomes on all traits, but at moderate values with emotional stability and openness, in line with previous studies that indicate positive links between neuroticism and information processing system 1 (Hilbig, 2008).

The results of decision-making are significantly predicted by the anxious decision-making style, i.e., people who tend to experience negative feelings during decision-making end up having better results when making daily decisions. This aspect is best highlighted by the structure of the network formed by the analyzed variables in which we

can see that there is a strong link between the anxious decision-making style and emotional stability. Since the opposite pole of emotional stability is neuroticism, we can say that people with an anxious decision-making style face a wide range of feelings specific to this decision-making style, such as fear, and insecurity, so they postpone deciding until they find the best solution.

People in command positions have a different decision style pattern compared with people in executive positions, so we can say about them that they avoid spontaneous decisions, use intuition less often than those who occupy executive positions, when they are not sure of results, and sometimes prefer to postpone a decision, they are vigilant, and analyzed all the available options. This is an interesting result in the sense that the work environment with its requirements changes the decision-making pattern in everyday life, increasing the quality of the decisions made by training them in the use of the decision-making styles specific to system 2 thinking.

The decision-making pattern of subjects who did not produce road events is characterized by the fact that they are vigilant, avoid making decisions spontaneously, and are confident in their ability to make decisions. They are not anxious or avoidant when they have to decide on the road.

The most important limitations of the present study may be that it is cross-sectional and that the data have self-report data. Thus, future research should attempt to expand upon this study using a longitudinal design and more bureaucratic indicators of outcomes decisions (for example, complaints from banks coming to the workplace for late loan payments).

Moreover, future research should assess these variables in other types of military organizations, (e.g. police), because might have contexts for decision-making that differ, for example by being more (or differently) organized and led.

Another limitation is related to the psychometric quality of the DOI test, and from this perspective, the need to adapt to the population of the country of origin of the subject sample is obvious. To be able to use the inventory of decision results (DOI) successfully, it is necessary to adapt to the specifics of the military environment, and we will have to give up some elements that do not apply to this type of population (for example the item: Were you in prison even for a day?). The fact that this tool is self-reported creates the possibility for subjects to evade a personal history of finalized decisions with negative results. Another limitation is the small number of subjects regarding the number of variables involved in the study.

This study is one of the first to investigate the relations between decision-making styles and decision outcomes in a military population, and future studies may address the relationship between decision-making styles and other relevant constructs by assessing decision-making competence in military personnel using situational tests involving the decision-making process.

The results of this study confirm that most everyday decisions are made using intuition, which belongs to the information processing system 1, this result follows the theory proposed by Stanovich (1998).

As Leykin and DeRubeis have obtained results that have confirmed the close link between avoidant, obsessive, and anxious decision-making styles with the main symptoms of depression, I believe that decision-making style questionnaire can be a solution to identify depressive states in military returning from missions in theaters of operations.

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APENDIX A

Cronbach's α values at the analyzed scales

Scale	No. of Items	α	Lower Bound	Upper Bound
DOI	30	.65	.58	.72
DSQ				
Confident	2	.79	.73	.86
Respected	5	.81	.76	.85
Intuitive	5	.83	.79	.87
Spontaneous	4	.61	.53	.70
Vigilant	6	.90	.87	.92
Dependent	6	.77	.71	.82
Anxious	5	.86	.83	.90
Obsessive	5	.58	.48	.68
Avoidant	5	.76	.70	.82
CP5F				
Agreeableness	24	.87	.84	.90
Emotional Stability	21	.91	.89	.93
Autonomy	22	.70	.64	.77
Extraversion	23	.89	.87	.91
Conscientiousness	25	.87	.84	.90
Social Desirability	15	.75	.69	.80

Note. The lower and upper bounds of Cronbach's α were calculated using a 95% confidence interval.

APPENDIX B

Descriptive statistics

Variable	*M*	*SD*	α	SE_M	Min	Max	Skewness	Kurtosis	*Mdn*
DOI	.15	.08	.65	.01	.03	.39	.76	.37	.15
DSQ									
Confident	4.48	.48	.79	.04	3.00	5.00	-.56	-.66	4.60
Respected	3.86	.64	.81	.05	2.00	5.00	.08	-.52	4.00
Intuitive	3.35	.79	.83	.06	1.00	5.00	.02	-.12	3.40
Dependent	2.99	.69	.77	.05	1.00	4.67	-.41	.35	3.17
Avoidant	2.06	.67	.76	.05	1.00	4.00	.27	-.28	2.00
Obsessive	2.37	.58	.58	.04	1.00	4.00	0.01	-.17	2.20
Vigilant	4.04	.64	.90	.05	1.00	5.00	0.98	4.34	4.00
Anxious	1.72	.60	.86	.05	1.00	3.40	.30	-.70	1.80
Spontaneous	2.67	.61	.61	.05	1.00	4.00	.01	.52	2.75
CP5F									
Emotional Stability	4.20	.40	.91	.03	3.24	4.76	-.26	-.92	4.21
Agreeableness	4.11	.40	.87	.03	3.17	5.00	.27	-.65	4.08
Autonomy	3.45	.26	.70	.02	2.95	4.32	.56	.32	3.41
Extraversion	3.85	.50	.89	.04	2.39	4.96	-.19	.00	3.87
Conscientiousness	4.25	.38	.87	.03	3.32	5.00	.10	-.76	4.20
Social desirability	4.47	.34	.75	.03	3.47	5.00	-.33	-.44	4.47

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RESEARCH ARTICLE

Investigating the Link between Flow, Perceived Feedback and Performance in Art

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Abstract

The current study set out to investigate the effect of flow experienced during artistic activities on performance. Furthermore, the study looked into how the relationship between flow and performance was affected by a moderating variable, namely the perceived feedback given by art teachers. Based on a non-experimental cross-sectional model, the research included a sample of 108 students of various art degrees. The results suggested that flow predicts performance in art ($\Delta R^2 = .10$, $p < .001$), while perceived feedback acts as a moderator on the link between flow and performance ($F(3, 104) = 11.17$, $p < .001$), having a buffering effect and not an enhancing effect as this study initially proposed ($\Delta R^2 = .057$, $\beta = -.24$, $p < .01$). Moreover, a separate moderation analysis was performed for each subscale of the perceived feedback measuring instrument. Some possible explanations of the buffering effect are presented based on the scientific literature.

Keywords

flow, perceived feedback, performance, art, artistic activities

Understanding the psychological factors that contribute to high levels of performance in a variety of activities is among the top priorities of applied psychology. One of the key constructs of positive psychology is flow, also known as "optimal experience" (Csikszentmihalyi, 1990), terms used almost interchangeably. Throughout time, flow has often been correlated with high levels of performance in various domains, such as work (Demerouti, 2006; Quinn, 2005), music (De Manzano et al., 2010; Wrigley, & Emmerson, 2011), some studies, particularly in sports, indicating that flow is a significant predictor of performance (Bakker et al., 2011; Stavrou et al., 2014). In the current research, artistic activities were investigated as flow-generating activities, in their numerous forms (plastic arts, music, acting, film imaging, directing, design, etc.) found within a university setting. According to previous research (Csikszentmihalyi, 1990; 1997; Csikszentmihalyi, & Csikszentmihalyi, 1992), flow is very commonly experienced in such activities as they have the potential to fulfill the more or less necessary preconditions for the emergence of this phenomen, a fact that is presented in more detail in the following section.

The majority of previous research conducted in the field of flow experienced during artistic activities sought to investigate the psychophysiological elements of flow (De Manzano et al., 2010) or to identify the psychological antecedents and correlates of flow in order to better understand the factors

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that can facilitate or, on the contrary, prevent the occurence of this phenomen (Hefferon, & Ollis, 2006; Martin, & Cutler, 2002; Wrigley, & Emmerson, 2011). Starting from already existing data which support the applicability of flow-related theories in domains such as sports (Jackson, 1992; 1995), an extension of these theories have been made to other domains, such as music (Wrigley, & Emmerson, 2011) and acting (Martin, & Cutler, 2002), increasing the validity and universality of both theories and measurement tools used until that point only in the fields of sports and work.

In order to obtain a high performance, another variable that has been identified to play an important role is the feedback provided by supervisors, namely the college teachers. Although the scientific literature presents numerous evidence on the beneficial effect of feedback on performance in fields such as sports and work, regardless of the feedback's nature (positive or negative; e.g., Choi et al., 2018; Koka, & Hein, 2005; 2006), no other study has sought to look into more detail to find out how feedback provided by art teachers, as perceived by students, can influence the relationship between the experience of flow and the quality of performance achieved.

Moreover, this research aims to increase the number of psychological studies conducted in the field of art and hopes to help teachers in their classroom practice, and young artists in their pursuit of excellence. Focusing on such positive states as flow can provide significant psychological benefits that can improve learning outcomes and teaching styles (Wrigley, & Emmerson, 2011).

Flow - conceptualization

Attributed to a valuable and intriguing phenomenon, the concept of flow denotes a "complete absorption in the present moment" (Nakamura, & Csikszentmihalyi, 2005, p. 89). Similar to an altered state of consciousness, the flow state is manifested by focused attention on the action currently being performed, loss of self-awareness by identifying the self with said action, temporal distortion, etc., this experience leading to intrinsic rewards that are not altered by differences in culture, social class, gender, age or activity involved (Nakamura, & Csikszentmihalyi, 2005).

The name of this phenomen was given by psychologist Mihaly Csikszentmihalyi. He studied the creative process in the 1960s, noting that an artist persists unceasingly in the conception of a painting, ignoring physical needs until its completion, at which point he loses interest (Getzels, & Csikszentmihalyi, 1976). Research on this phenomenon originates in the study of human motivation to devote a significant amount of time to certain types of activities (arts, sports, etc.), as it provides pleasant experiences simply by participating in the process. Known as intrinsic motivation, it is the main element of interest and starting point in the research of flow (De Manzano et al., 2010; Nakamura, & Csikszentmihalyi, 2005). Those in the flow state have an experience called "autotelic experience" (from the Greek "auto" meaning "self", and "telos" meaning "goal"), meaning that they are experiencing an intrinsically motivating activity. This activity becomes an end in itself, the ultimate goal becoming only an excuse for the process itself (Bakker et al., 2011; Csikszentmihalyi, 1990). The ability to experience flow appears to be universal, but people differ in the frequency and quality of experiencing this state (Csikszentmihalyi, & Csikszentmihalyi, 1998; Nakamura, & Csikszentmihalyi, 2005; Privette, & Bundrick, 1991; Stein et al., 1995), which may indicate the existence of individual and situational factors that can contribute to the emergence of flow.

According to Nakamura și Csikszentmihalyi (2005), the theoretical model of flow emphasizes interactionism, that is, the dynamic system made up of a person and their environment, rather than focusing strictly on individual characteristics detached from their context, therefore suggesting a focus on phenomenology rather than on personality. The goal here is to understand the dynamics of momentary experiences and the conditions in which they are optimal. Csikszentmihalyi (1985) also theorizes the concept of emergent motivation, a term that seeks to highlight the fact that motivation emerges from the actual interaction within the specific activity, instead of being dictated in

advance by a pre-existing intentional structure found in the person or in the environment.

It is important to note that flow is not considered to be an all-or-nothing peak experience, but rather is seen as a continuous variable that can be used to characterize the quality of experiences in everyday activities (Csikszentmihalyi , & Csikszentmihalyi, 1992). Flow was conceived in terms of degrees existing on a continuum, from low or light flow, attributed rather to automatic, uncomplicated and unstructured activities, such as doodling, smoking, etc., to deep flow, associated with activities with a higher level of complexity, such as chess, composing, surgery, leading to the so-called "peak performance" (Csikszentmihalyi, 1975). Flow appears spontaneously, however, and cannot be initiated intentionally because attempts in this direction will make the possibility of entering flow even smaller (Csikszentmihalyi, 1990; Jackson, & Csikszentmihalyi, 1999). Also, according to the empirical data Csikszentmihalyi's studies (1990; 1997), people tend to experience flow when they engage in active behavior as opposed to performing passive activities (such as watching TV, for example). This is self-evident, since in order to experience the state of flow, an important condition, although not necessary (Nakamura, & Csikszentmihalyi, 2005), is that a person invests time and energy, this only happening in case of encountering challenges. According to Csikszentmihalyi (1990), entering a state of flow depends on establishing a balance between the challenges of a situation and the self-perceived abilities to manage those challenges. This balance is fragile, however, because if the challenges encountered begin to exceed personal abilities, this will lead to vigilance, followed by stress and anxiety; instead, if the skills start to surpass the challenges, the person will start to relax, which will then lead to boredom. Moreover, researchers generally agree that flow is more likely to occur when the person perceives this balance to exist (e.g., Bakker, 2005; 2008; Csikszentmihalyi, 1990; Fullagar, & Kelloway , 2009), resulting in an optimal experience. Therefore, "the effortless absorption experienced by the practiced artist at work on a difficult project always is premised upon earlier mastery of a complex body of skills" (Nakamura, & Csikszentmihalyi, 2005, p. 91).

Throughout time, it has been argued that flow, being a multidimensional concept, includes several components or conditions necessary for its emergence, such as the balance between abilities and requirements mentioned previously, the loss of self-awareness (the person no longer perceives himself as a social actor, no longer appeals to the reflexive capacity), the fusion between awareness and the activity carried out in the present moment (the central point of awareness, of attention, is reduced to the activity itself, people are no longer aware of themselves as separate from the activities carried out), clear goals, focus, a strong sense of control over one's actions, distortion of temporal experience (usually in the sense of time passing faster), immediate and clear, unambiguous feedback, and autotelic experience (Csikszentmihalyi, 1990; Csikszentmihalyi, & Csikszentmihalyi, 1992; Jackson , & Csikszentmihalyi, 1999; Jackson, & Eklund, 2002; Nakamura, & Csikszentmihalyi, 2005). Thus, the previously mentioned characteristics are frequently encountered within artistic activities, artists being free to choose a task in their field of activity that suits their level of abilities, the feedback being instantaneous and continuous, the activity itself depending on the fusion between action and state of consciousness, requiring a somewhat high degree of attention and concentration, offering the possibility of total control over one's actions, etc., which makes art stand out among activities with increased flow-generating potential.

In this research, flow was conceptualized as consisting of three key components, a fact found mainly in research of flow experienced in the organizational field (e.g., Csikszentmihalyi, 1997; Csikszentmihalyi et al., 1993; Larson , & Richards, 1994, as cited in Bakker, 2008). These components are absorption, enjoyment and intrinsic motivation. Absorption refers to a state of concentration and total immersion in the activity carried out, while enjoyment refers to a positive judgment on the quality of life during that activity (e.g., work; Veenhoven,

1984). Intrinsic motivation, discussed previously, refers to carrying out an activity with the aim of experiencing the pleasure and satisfaction inherent in it (Deci, & Ryan, 1985). For flow to occur, it is essential that the person is fully engaged in an activity that is both enjoyable and meaningful to them (Csikszentmihalyi, 1999). The reason behind choosing to operationalize flow as a three-dimensional experience made up of absorption, enjoyment and intrinsic motivation, similar to research in the field of organizational psychology (Bakker, 2005; 2008), derives from the fact that this study focuses on artistic activities in a university setting, which can be likened to work activities at the office, while feedback, a variable that will be detailed further, is being provided by people of a higher rank who hold more knowledge in the field than the participants, namely art teachers in this study, who can be likened to supervisors at work. The experience of flow through these three components is also of major importance in the case of artistic involvement, with Csikszentmihalyi (1993) suggesting that games, sports and artistic performances are expressly designed to facilitate flow.

The link between flow and performance

One of the most studied and desirable consequences of flow, because of its positive value, is performance. Studies across several activities, including chess, writing, sports, and the visual arts, have found a positive correlation between measures of flow and objective measures of performance quality (Csikszentmihalyi, & Csikszentmihalyi, 1992). Thus, it has been suggested that flow may function as a reward signal to promote practice in that activity (Csikszentmihalyi, 1997).

Referring back to the theoretical model of flow, an improved performance is expected from the very fact that the experience of flow prompts a person to persist in that activity due to the intrinsic rewards it promises, assimilating higher and higher levels of skills (Engeser, & Rheinberg, 2008; Nakamura, & Csikszentmihalyi, 2005). Being defined as a state of high functioning (Engeser, & Rheinberg, 2008), based on the fact that it requires a high level of concentration and, moreover, the investment of all available energy resources towards specific elements in the environment, flow determines participants from various activities to set themselves greater and greater challenges as they come to master the requirements of the previous challenges. To continue to experience flow, they need to identify and engage in increasingly complex activities, suggesting that flow sustains growth itself by fostering skill improvement and encouraging people to come back to the same activities simply because they allow them to have pleasant experiences while performing them. This continuous return to activities in which people experience flow is justified by empirical data that flow has been associated with engagement, achievement (Carli et al., 1988; Mayers, 1978; Nakamura, 1988; Rivkin et al., 2018), while the quality of experience has been associated with persistence in an activity (Nakamura, & Csikszentmihalyi, 2005). Moreover, it has been proposed that flow is similar to an eudaimonic experience of well-being, since the two constructs show a number of similarities, such as the existence of common elements in their conceptualization (a sense of control and mastery over the task, clear purpose, the belief that one has the skills to perform the task optimally, engagement, and a sense of enjoyment; Csikszentmihalyi, & Csikszentmihalyi, 1988), and that both enhance human growth and potential (Jackson, & Wrigley, 2004; Ryan, & Deci, 2001).

According to Quinn (2005), flow is the experience of acting skillfully, through both intellect and physical action, as the achievement of a goal is desired. Relevant skills and information are applied within action in such a way as to facilitate movement in the desired direction towards achieving the desired end state, which is precisely why Quinn (2005) argues that flow is considered to be a high performance experience.

To summarize, flow has continued to be correlated with a high level of performance in various fields of activity over time, including sports, work (Demerouti, 2006; Eisenberger et al., 2005; Quinn, 2005) and music (De Manzano et al., 2010; Wrigley, & Emmerson,

2011). In several of these, empirical evidence has been found that flow is a significant predictor performance in a given activity, one of the most relevant fields for this relationship being sports (e.g., Bakker et al., 2011; Jackson et al., 2001; Landhäußer, & Keller, 2012; Stavrou et al., 2014). Noting a lack of such studies in the artistic field, the current research seeks to investigate the effect of flow experienced within artistic activities on resulting performance, therefore proposing the following hypothesis:

H1: Flow predicts performance in artistic activities.

The moderating role of perceived feedback on the link of flow and performance

The relationship between flow and performance can be moderated by a variety of factors, among which a considerable role may be attributed to perceived feedback.

Feedback is a valuable component in many fields because of the various effects it can have on the people to whom it was directed. It is also considered the central element of performance management, as it is able to guide, motivate, strengthen or reduce to the point of stopping a certain behavior, depending on its nature, whether it is beneficial or not (London, 1997). Despite all the implications of feedback, this study will consider only that type of meaningful feedback, provided for the purpose of improving individual performance, as indicated by a number of previous studies that have shown feedback to significantly influence performance in certain fields (Choi et al., 2018; Earley, 1986; Gershgoren et al., 2011). Also, the measurement will be carried out according to how this feedback is perceived by the participants, namely the art students, based on their supervisors' behavior, in this case the art teachers. Perceived feedback can be defined as students' perception of teachers' assertions about their performance, assertions that do not actually clearly inform students about what they have done well or not, but are rather used to encourage, in the case of a feedback perceived as positive, or to criticize, in the case of feedback perceived as negative (Koka, & Hein, 2005; 2006). A number of researchers have noted that self-reported thoughts are more accurate predictors of student achievement than estimations provided by observers (Peterson, & Swing, 1982; Peterson, Swing, Stark, & Waas, 1984, as cited in Wittrock, 1986).

Feedback as a variable has received attention in a large number of studies in diverse fields such as education (Behets, 1997), sports (Gershgoren et al., 2011) and work (Choi et al., 2018; Earley, 1986). There is evidence to support that teacher interactions with students and the feedback they provide can affect students' motivation, perceptions, and willingness to continue making efforts to improve their performance (Amorose, & Weirss, 1998; Goudas et al., 2000). Goudas and collaborators (2000) studied the effect of positive and negative feedback on undergraduate students, concluding that positive feedback improves perceptions of competence, as opposed to negative feedback. However, these studies were concerned with the effect of actual feedback from teachers and not feedback perceived by pupils or students. Studies that have considered students' perspectives on teacher-provided feedback have consistently indicated that students value direct teacher-provided feedback, valuing it far more than other forms of feedback such as peer feedback or self-assessment (e.g., Saito, 1994; Yang et al., 2006, as cited in Lee, 2008).

Koka and Hein (2003) developed the Perceived Teacher's Feedback Scale (or PTF), which was revised 3 years later (Koka, 2006), to investigate the relationship between perceived teacher feedback and intrinsic motivation , one of the flow components also considered in this study. Although the tool has been applied in the sports field, based on the investigations carried out in the scientific literature, it has proven to be the most suitable for the artistic field as well. Physical education teachers' feedback-giving behaviors were considered similar to those of art teachers. These included both verbal and non-verbal forms of feedback, such as facial expressions (e.g., angry facial expressions, disapproving head nods) or physical contact (e.g.,

encouraging touching or patting on the shoulder). According to researchers, it is indicated that in order to give a clear and consistent message to students, it is important for teachers to use both verbal and non-verbal forms of communication (Martens, 1987; Yukelson, 1998, as cited in Koka, 2006), more so considering the fact that 70% of communication is non-verbal (Martens, 1997, as cited in Koka, 2006). Application of this scale on different student samples indicates that perceived positive general feedback is a valid predictor of intrinsic motivation and its components, such as perceived competence and enjoyment.

Analyzing students' self-reported data related to their teacher's feedback can provide important information in order to examine the effects of feedback itself on the psychological outcomes in students' lives, which is why this relationship (between feedback and psychological outcomes, such as intrinsic motivation) has received much attention in the scientific literature of sports. Numerous studies in this field have demonstrated that perceptions related to the coach's positive feedback are strong predictors of perceived competence, interest, enjoyment and intrinsic motivation (Koka, & Hein, 2005), the last two factors being also regarded as flow dimensions. However, a lower number of studies analyzes the effects of perceived teacher feedback, an important lack in the literature as institutionalized education is very different that practicing similar activities in other settings (artists evaluated by mentors/auditorium, etc.), where it is considered that those involved may already have a certain level of motivation due to the voluntary nature of their activity, this motivation eventually leading to performance. Thus, the present research will investigate the increment brought by art students' perceived teacher feedback on the relationship between flow and performance.

H2: Perceived feedback will moderate the link between flow and performance, in the sense that it will enhance flow's effect on performance.

Methodology

Design

This research is based on a non-experimental, cross-sectional design model, as the variables were investigated at a single point in time without controlling or manipulating them. The variables considered were flow as the independent variable, performance as the dependent variable, and perceived feedback as the moderating variable.

Data collecting procedure

Participant data was collected through a Google Docs form between January and April 2020, the form being addressed only to people who are currently studying or have graduated with an Art degree at the time of completion. The data was collected through the snowball method due to the limited accessibility to the target population. Volunteers filling out the form were therefore instructed to forward it to colleagues and other acquaintances in the artistic field after completion. Additionally, participants were informed about confidentiality of the data collected and they gave their consent for the data to be used exclusively for academic purposes.

Participants

The sample was made out of 108 Art degree students. This included 57 women (52.8%) and 51 men (47.2%), aged between 19 and 47 years old ($M = 23.85$, $SD = 5.76$). Respondents came from both state institutions (78.7%), as well as private institutions (21.3%), from various subfields of art (22.2% musical interpretation, 17.6% acting, 17.5% plastic arts – painting, graphic design, photo-video image processing –, 14.8% film imaging, 14.8% film direction, 4.6% design – interior design, scenography –, and a percentage of 8,3% from other specializations, such as architecture and puppetry). Among them, most were in the process of completing their Bachelor's degree (69.4%, out of which 20.4% were 1st year students, 26.9% were 2nd year students, and 22.2% were 3rd year students), a percentage of 12.9% was made up of students undergoing a Master's degree (out of which 4.6% were 1st year students and 8.3%

were 2nd year students), while the rest, consisting of 17.6%, were graduates.

Instruments

Flow. Flow was measured using an adaptation of The Work-Related Flow Inventory (WOLF; Bakker, 2008). In order to measure flow as experienced in artistic activities, the instrument was adjusted so that the study participants thought about their experience during art involvement instead of work.

The Work-Related Flow Inventory (Bakker, 2008) was translated into the Romanian language by Sîrbu (http://www.researchcentral.ro/index.php?action=listateste&ID=435) and adapted on a Romanian sample by Bădoiu and Oprea (2019). It contains three components, adapted accordingly to serve the current study (Absorption, Art Enjoyment instead of Work enjoyment, and Intrinsic Art Motivation instead of Intrinsic Work Motivation), each of them being made up of 4 items, respectively 5 for the latter one (e.g., Absorption: "When I am doing art, I think about nothing else."; "I get carried away by my art activities."); Art Enjoyment: "My artistic activities give me a good feeling."; "I feel happy during artistic activities."); Intrinsic Art Motivation: "I find that I also want to get involved in artistic activities in my free time."; "When I am involved in artistic activities, I am doing it for myself."), measured on a seven-point Likert scale (from 1 – Never, to 7 – Always).

Similar to the initial validation study by Bakker (2008) and the one based on a Romanian sample (Bădoiu, & Oprea, 2019), internal consistency indices were measured for each subscale of the instrument, indicating values similar to the previously mentioned studies: for the Absorption subscale – .86, for the Art Enjoyment subscale – .91, and for the Intrinsic Art Motivation subscale – .82.

Performance. Williams and Anderson's Performance Scale (Williams, & Anderson, 1991) was translated to Romanian by Iliescu (http://www.researchcentral.ro/index.php?action=listateste&ID=432) and adjusted so as to serve the present study. The original scale (Williams, & Anderson, 1991) contained 21 items, divided into 3 different subscales. All the items (7) that assess organizational citizenship behaviors that have a specific individual as target (OCBI) were kept (e.g., "I adequately complete assigned duties."), as well as 3 of the in-role behaviors items (IRB) (e.g., "Attendance in artistic activities is above the norm."), while the rest of the items, including the other 4 items of the IRB subscale and the all the items for the organizational citizenship behavior directed toward the organization (OCBO) subscale (e.g., "I take time to listen to colleagues' problems and worries.", respectively "I spend a great deal of time with personal phone conversations.") were deemed inadequate for measuring behaviors in the art field. In this study, the scale consists of 10 relevant items to measure the performance of Art students. The items are measured on a four-point Likert scale (1 – Strongly Disagree, 2 – Disagree, 3 – Agree, 4 – Strongly Agree). The values of items 6, 7, and 9 were reversed to measure the construct correctly.

Perceived Feedback. The modified and revised verion of the Perceptions of Teacher's Feedback Scale (PTF; Koka, & Hein, 2005) was used to measure art student's perceived feedback from their teachers. It contains 11 items in its final version, the rest of the items being eliminated due to them not fulfilling the validity condition following the confirmatory factor analysis (Koka, & Hein, 2005). The 11 items were divided into 4 distinct subscales, depending on their incremental value, namely the perceived positive general feedback (PPGF; e.g., "My work is frequently encouraged bt the teacher."), perceived knowledge of performance (PKP; e.g., "The teacher often gives me instructions/feedback."), perceived negative nonverbal feedback (PNNVF; e.g., "In response to a poor performance, the teacher looks angry."), and perceived positive nonverbal feedback (PPNVF; e.g., "In response to a good performance, the teacher pats me on the back.") subscale. Some of the items dealing with nonverbal feedback were taken from the nonverbal feedback categories previously used in the questionnaire version of the CBAS (Coaching Behavior Assessment System; Allen, & Howe, 1998, as cited in Koka, & Hein, 2005). The measurement is

made on a five-point Likert scale (from 1 – Strongly disagree, to 5 – Strongly agree). The items of the PNNVF subscale were reversed to adequately measure the construct of perceived feedback.

After analyzing the data separately according to each subscale, similar to the validation study of Koka and Hein (2005), the Alpha internal consistency indices indicate values higher than .70 for all the subscales (for PPGF – .72, PKP – .76, and PNNVF – .82), with the exception of the PPNVF subscale which, posing the risk of any two-item scale, presents a value lower than .70 (=. 59), therefore not being able to be taken into account in the following analysis.

Results

The data were statistically processed using SPSS (ver. 18.0).

Descriptive statistics

First of all, the mean and standard deviation of the studied constructs were identified based on the sample data from the target population. These are presented in Table 1.

Table 1. *The influence of socio-demographic indicators on the investigated constructs*

Socio-demographic indicators	N	%	Flow		Perceived Feedback		Performance	
			M	*SD*	*M*	*SD*	*M*	*SD*
	108	100%	75.51	11.61	33.78	32.53	32.40	5.07
Gender								
1. Male	51	47.2%	77.90	9.04	32.63	6.10	32.16	4.87
2. Female	57	52.8%	73.37	13.22	34.81	6.76	32.61	5.27
Age								
1. 19-24	84	77.8%	75.02	12.41	34.98	6.13	32.42	5.02
2. 25-30	13	12%	77.85	8.20	29.92	7.67	31.15	6.41
3. 31-47	11	10.2%	76.45	8.56	29.18	4.16	33.73	3.55
Education level								
1. Bachelor's	75	69.4%	75.35	11.97	35.21	5.95	32.60	4.92
2. Master's	14	13%	76.93	9.85	31.71	7.38	32.43	2.76
3. Graduate	19	17.6%	75.11	11.88	29.63	6.13	31.58	6.83
Artistic subfield								
1. Film imaging	16	14.8%	75.75	11.12	35.13	5.31	34.81	3.69
2. Film direction	16	14.8%	77.50	10.03	30.94	4.37	29.81	6.89
3. Plastic arts	19	17.6%	75.63	11.12	36.63	6.19	32.16	4.87
4. Musical interpretation	24	22.2%	72.17	14.44	37.04	5.76	32.21	4.82
5. Acting	19	17.6%	80.11	6.03	32.05	6.47	33.68	3.75
6. Design	5	4.6%	75.60	6.38	30.80	8.46	32.80	2.68
7. Others	9	8.3%	70.44	16.83	27.00	5.74	30.78	6.41

Inferential statistics

Moving forward, differences were observed between levels of flow, perceived feedback and performance based on gender, age, education level and artistic subfield, with socio-demographic indicators acting as independent variables. Thus, it seems that male participants had higher scores in the case of flow (M = 77.90, SD = 9.04), compared to female participants (M = 73.37, SD = 13.22), while in the case of the other two variables, female participants had higher scores (perceived feedback: M = 34.81, SD = 6.76; performance: M = 32.61, SD = 5.27), but not very different from those of male participants (perceived feedback: M = 32.63, SD = 6.10; performance: M = 32.16, SD = 4.87).

The age of the participants was divided into 3 groups (19-24, 25-30, 31-47), thus the

25-30-year-old group had the highest scores of flow (M = 77.85, SD = 8.20), followed by the 31-47-year-old group (M = 76.45, SD = 8.56), with the youngest group, the ones between 19-24 years old, ranking last (M = 75.02, SD = 12.41). In the case of performance, the highest scores were recorded in the 31-47-year-old group (M = 33.73, SD = 3.55), followed by the 25-30-year-old group (M = 31.15, SD = 6.41) and the 19-24-year-old one (M = 32.42, SD = 5.02). While for perceived feedback, the highest values belonged to the youngest group (M = 34.98, SD = 6.13), followed by similar values for the 25-30-year-old group (M = 29.92, SD = 7.67) and the 31-47-year-old group (M = 29.18, SD = 4.16).

Based on the educational level at the time of filling in the form, the highest Flow scores were found in Master's degree students (M = 76.93, SD = 9.85), especially those in the 1st year of their Master's (M = 82.40, SD = 6.98). The highest scores in the case of perceived feedback were found among Bachelor's degree students (M = 35.21, SD = 5.95), especially those in their 2nd year of Bachelor's (M = 37.55, SD = 5.50), while for performance the mean values are very similar, with Bachelor's students having the highest score (M = 32.60, SD = 4.92).

In terms of aristic subfields, the highest Flow scores were found in acting students (M = 80.11, SD = 6.03), followed by film direction students (M = 77.50, SD = 10.03), imagine de film (M = 75.75, SD = 11.12), plastic arts (M = 75.63, SD = 11.12), design (M = 75.60, SD = 6.38), musical interpretation (M = 72.17, SD = 14.44) and others (M = 70.44, SD = 16.83). Perceived feedback had the highest values in the case of musical interpretation students (M = 37.04, SD = 5.76), followed by plastic arts (M = 36.63, SD = 6.19), film imaging (M = 35.13, SD = 5.31), acting (M = 32.05, SD = 6.47), film direction (M = 30.94, SD = 4.37), design (M = 30.80, SD = 8.46) and others (M = 27.00, SD = 5.74). Last but not least, the highest scores for Performances were found in film imaging students (M = 34.81, SD = 3.69), followed by acting students (M = 33.68, SD = 3.75), design (M = 32.80, SD = 2.68), musical interpretation (M = 32.21, SD = 4.82), plastic arts (M = 32.16, SD = 4.87), others (M = 30.78, SD = 6.41) and film direction (M = 29.81, SD = 6.89).

All the values were included in Table 1, along with the descriptive statistics.

Moving further to the moderation analysis and bearing in mind that the existence of such an effect is tested through two steps involving two different statistical tests, namely the Pearson correlation and the hierarchical linear regression, they will be presented in the following section.

To verify that the conditions for applying the regression analysis are met, a Pearson correlation test was applied to assess the association between the independent and the dependent variable, namely between flow (M = 75.51, SD = 11.61) and performance (M = 32.40, SD = 5.07). A statistically significant positive correlation was found between the two variables, with $R(108) = .32$, $R^2 = .10$, $p < .01$, thus verifying the first condition. Confidence interval limits (95%) were between .14 and .47. Likewise, a Pearson correlation was also used to test the association between the independent variable and the moderator variable, namely between flow and perceived feedback (M = 33.78, SD = 6.52). A statistically insignificant negative correlation was obtained between flow and perceived feedback, with $R(108) = -.00$ (= -.008), $R^2 = .00$, $p > .05$, thus verifying that the second condition is also met. Confidence interval limits (95%) were between -.19 and .18.

Table 2. *Correlation test results in the link between flow, perceived feedback, and performance (N = 108)*

		M	*SD*	*1*	*2*	*3*
1.	Flow	75.51	11.61	-		
2.	Perceived feedback	33.78	6.52	-.00	-	
3.	Performance	32.40	5.07	.32*	.27*	-

Note: *p < .01.

After the previous results showed that the two conditions (significant correlation between IV and DV and insignificant correlation between IV and Mo, according to Table 2), the hierarchical linear regression can be applied. The values of the two predictors (IV and Mo) were transformed into standardized z-scores so that their interaction variable (Flow*Perceived feedback) should not generate collinearity with any one of the two predictors. The interaction variable will be obtained then by the multiplication of the predictors' standardized z-scores.

In order to test the first hypothesis of the study (H1: *Flow predicts performance in artistic activities.*), the IV (flow) was initially introduced by itself in the first step of the linear regression analysis. The results are presented in Model 1.1 (Table 3). For the second hypothesis of the study (*H2*), a second regression analysis was done in order to examine whether perceived feedback acts as a moderator in the link between flow and performance. Therefore, the perceived feedback variable was introduced alongside flow in the first step, while their interaction variable (Flow*Perceived feedback) was introduced in the second step of the model. The results are presented in Models 1.2 and 1.3 (Table 4).

Table 3. *Linear regression analysis for the predictor flow and the criterion performance (N=108)*

Predictor	Performance				
	B	*R*	R^2	ΔR^2	*F*
Model 1.1		.32**	.10**	.10	12.72
1. Flow	.14*				

Note: $p < .01$*, $p < .001$**.

Table 4. *Moderation analysis of perceived feedback in the link between flow and performance (N = 108)*

Predictors	Performance				
	B	*R*	R^2	ΔR^2	*F*
Model 1.2		.43**	.18**	.18**	12.03
1. Flow	.14**				
2. Perceived feedback	.21*				
Modelul 1.3		.49	.24	.05*	11.17
1. Flow*Perceived feedback	-1.07*				

Note: $p < .01$*, $p < .001$**.

Multicollinearity between variables was low (Tolerance = 1.00, VIF = 1.00). The Durbin-Watson test for autocorrelation of residuals was also used, indicating an appropriate value (= 1.70), thus no autocorrelation. It also met the assumption of non-zero variance.

The results show that Model 1.1 (Table 3) is statistically significant: $F(1, 106) = 12.72$, $p = .001$. Therefore, flow is a significant predictor of performance ($\beta = .32$, $t = 3.56$, $p = .001$), supporting the first study hypothesis (*H1*). Flow accounted for 10% ($\Delta R^2 = .10$, $p < .001$) of the variance in performance. For each unit added to flow, performance value increases by .14 points ($B = .14$, $p < .001$), therefore if flow increases, performance will also increase.

The second linear regression indicates that Model 1.2 (without the interaction between VI

and Mo, see Table 4) is statistically significant: $F(2, 105) = 12.03$, $p < .001$. Similarly, Model 1.3 (with the interaction between VI and Mo, see Table 4) also proved to be statistically significant: $F(3, 104) = 11.17$, $p < .001$. No collinearity problems were reported in the interaction model between flow and perceived feedback either (Tolerance = .99, VIF = 1.00), with the Durbin-Watson test again indicating an appropriate value (= 1.94).

The results show that the effect of the interaction on performance adds .05 ($\Delta R^2 = .057$, $p < .01$) more than flow alone as a predictor, meaning that the interaction between flow and perceived feedback makes up 5% of the 24% belonging to the predictors introduced in Model 1.3 which explain the variance in performance. This supports the first part of H2 as perceived feedback is shown to be a significant moderator in the link between flow and performance. However, interpreting the unstandardized coefficient, which quantifies flow's effect on performance when perceived feedback changes by a unit, reveals that the moderation has a buffering effect on the relationship ($B = -1.07$, $p < .01$), as opposed to the enhancement effect we were expecting according to the second hypothesis (H2: *Perceived feedback will moderate the link between flow and performance, in the sense that it will enhance flow's effect on performance.)*. This means that for any unit added to perceived feedback, increasing flow by one unit causes the performance value to decrease by 1.07 points – if the interaction increases, performance decreases. As based on previous research in this field (e.g., Koka, & Hein, 2005; 2006), an enhancement effect was to be expected rather than a buffering one, in what follows we made some attempts in order to understand this unexpected result.

To better understand the way the moderation effect of perceived feedback manifested on the relationship between flow and performance, the variation of said relationship at different values of perceived feedback was analyzed (low values at 1 standard deviation below the mean, average values around the mean and high values at one standard deviation above the mean). This analysis was done using PROCESS (Hayes, 2012).

The analysis shows that, when the scores of perceived feedback are low, meaning around 1 SD below the mean, flow is a significant predictor of performance ($B = .22$; $t = 4.77$, $p < .001$; CI 95%: .1335 – .3231). When perceived feedback scores are around the mean (between -1SD and +1SD), flow is again a significant predictor of performance ($B = .13$; $t = 3.63$, $p < .001$; CI 95%: .0618 – .2099). However, at higher score values of perceived feedback, meaning over 1 SD above the mean, flow is not a significant predictor of performance ($B = .04$; $t = .84$, $p > .05$; CI 95%: -.0590 – .1458). Therefore, only at low and medium levels of perceived feedback does flow have a statistically significant effect on performance. These results are presented in Table 5.

Depending on the level of flow scores and perceived feedback (low, medium, high), performance takes a certain value. For example, in the interaction between a low flow score (-11.61) and a low perceived feedback score (-6.52), performance takes a value of 28.28. There are a total of 9 possible interactions, which can be visualized in Figure 1.

Table 5. *The effects of flow on performance at different values of perceived feedback*

Moderator	Perceived feedback					
	Value	Effect	*SE*	*t*	*LLCI*	*ULCI*
Low score	-6.52	.22*	.04	4.77	.13	.32
Medium score	0	.13*	.03	3.63	.06	.20
High score	6.52	.04	.05	.84	-.05	.14

Note: $p < .001$*.

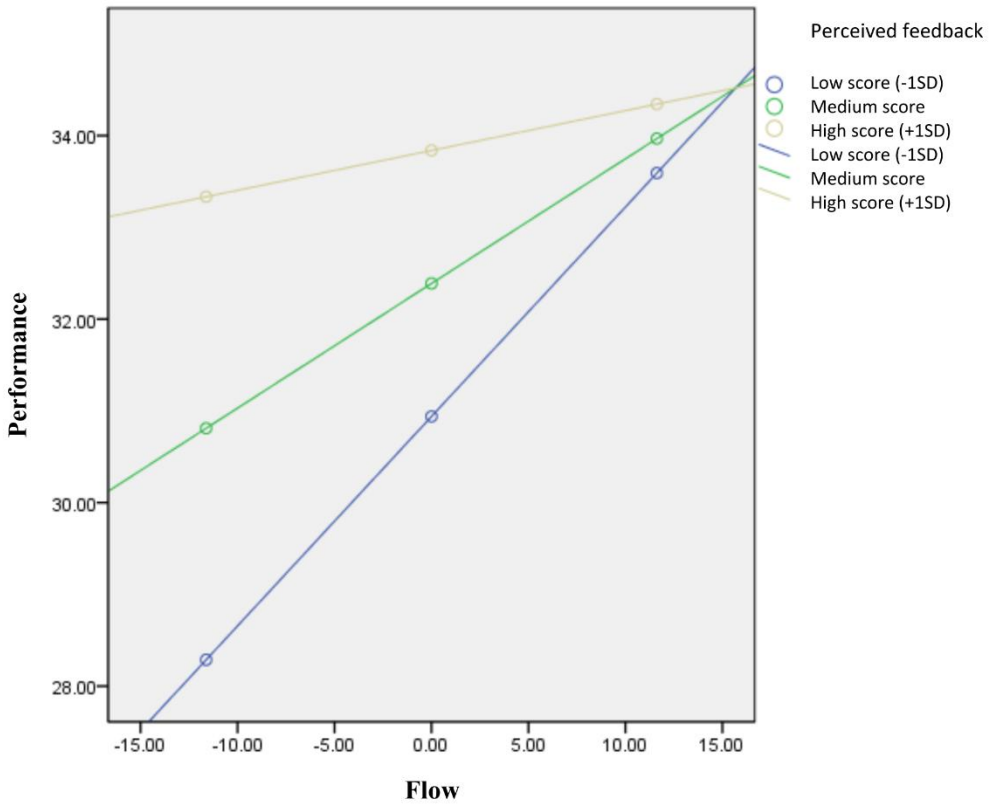

Figure 1. Simple slopes of flow which predicts performance at 1 SD below the mean of perceived feedback (low scores), at around the mean of perceived feedback (medium scores) and at 1 SD above the mean of perceived feedback (high scores)

According to the Johnson-Neyman technique included in the statistical analysis, a technique which presents the effect of flow on performance based at several values of perceived feedback, it was observed that the link between flow and performance is no longer significant starting with perceived feedback scores greater than 37.38.

Moreover, the moderating effect of perceived feedback was also analyzed according to the three subscales of the measuring instrument, represented by perceived general positive feedback (PPGF), perceived knowledge of performance (PKP) and perceived negative nonverbal feedback (PNNVF), with the perceived positive nonverbal feedback (PPNVF) subscale being removed from the statistical analysis due to it not meeting an adequate value of internal consistency, as previously mentioned. Thus, Table 6 shows the values of the Pearson correlation coefficients resulted between flow, performance and the three subscales of perceived feedback.

Table 6 shows that the two conditions required for the application of hierarchical linear regression analysis are met, namely the statistically significant correlation between VI and VD (flow and performance) and the lack of statistically significant correlation between VI and the three subscales of the moderating variable, perceived feedback, taken separately. The values of the interactions between flow and each subscale of perceived feedback (Flow*PPGF; Flow*PKP; Flow*PNNVF) were transformed into standardized z-scores so that they would not generate collinearity with any of the two predictors involved. The interaction variable between the two predictors will then be obtained by multiplying the standardized z-scores resulted.

Table 6. Correlation test results for the link between flow, performance and the PPGF, PKP, and PNNVF subscales of perceived feedback (N = 108)

		M	*SD*	1	2	3	4	5
1.	Flow	75.51	11.61	-	-	-	-	-
2.	Performance	32.40	5.07	.32**	-	-	-	-
3.	PPGF	10.22	2.57	.15	.38**	-	-	-
4.	PKP	12.32	2.49	-.00	.27**	.58**	-	-
5.	PNNVF	11.23	3.29	-.13	.04	.26**	.42**	-

Note: $p < .05$*, $p < .01$**;
PPGF = Perceived positive general feedback; PKP = Perceived knowledge of performance; PNNVF = Perceived negative nonverbal feedback.

Next, the three subscales of perceived feedback were examined as moderating variables in the link between flow and performance. The results are presented in Table 7.

Table 7. Moderation analysis for the three subscales of perceived feedback (PPGF, PKP, PNNVF) on the link between flow and performance (*N* = 108)

Predictors	Performance							
	R	R^2	ΔR^2	*F*	*B*	*SE*	*β*	*t*
Model 2.1	.47***	.22***	.22***	15.08***				
1. Flow					.11**	.03	.27*	3.21
2. PPGF					.68***	.17	.34***	3.95
Model 2.2	.51*	.26*	.03*	12.35***				
1. Flow					.09*	.03	.22*	
2. PPGF					.66***	.16	.33***	2.50
3. Flow*PPGF					-.82*	.35	-.20*	3.92
								-2.36
Model 3.1	.42***	.18***	.18***	11.69***				
1. Flow					.14***	.03	.32***	3.72
2. PKP					.55**	.18	.27**	3.10
Model 3.2	.44	.19	.01	8.40***				
1. Flow					.13***	.03	.31***	3.61
2. PKP					.55**	.17	.27**	3.11
3. 1.Flow*PKP					-.53	.42	-.11	-1.29
Model 4.1	.33**	.11**	.11**	6.83**				
1. Flow					.14***	.04	.34***	3.66
2. PNNVF					.13	.14	.09	.97
Model 4.2	.42**	.18**	.06**	7.71***				
1. Flow					.16***	.04	.38***	4.25
2. PNNVF					.18	.13	.12	1.36
3. Flow*PNNVF					-1.42**	.48	-.26**	-2.91

Note: $p < .05$*, $p < .01$**, $p < .001$***.
PPGF = Perceived positive general feedback; PKP = Perceived knowledge of performance; PNNVF = Perceived negative nonverbal feedback.

The results show that the interaction model of flow and PPGF is statistically significant: $F(3, 104) = 12.35$, $p < .001$. It explains 26% ($R^2 = .26$, $p < .05$) of the variance in performance, with the interaction variable increasing the explained variance by approximately 4% ($\Delta R^2 = .039$, $p < .05$). The *B* coefficient for the interaction effect of flow and PPGF on performance is significant ($B = -.82$, $t[108] = -2.36$, $p < .05$), again indicating a buffering effect on the dependent variable – with each unit added to this interaction, the value of performance is reduced by -.82.

In the second moderation, the model including the interaction between flow and PKP also turned out to be significant: $F(3, 104) = 8.40$, $p < .001$. However, the increment brought to the explained variance in performance was not significant ($R^2 = .19$, $\Delta R^2 = .013$, $p > .05$).

Moving forward, the interaction model between flow and PNNVF is also significant: $F(3, 104) = 7.71$, $p < .001$. It explains 18% ($R^2 = .18$, $p < .01$) of the variance in performance, with the interaction variable increasing the explained variance by approximately 7% ($\Delta R = .067$, $p < .01$). The same buffering effect on the link between flow and performance is observed in this case as well, based on the *B* coefficient ($B = -1.42$, $t[108] = -2.91$, $p < .01$).

As both the multicollinearity index values (tolerance index and VIF) and Durbin-Watson test results were within the recommended values in all three regression analyses, we understand that there were no problems with multicollinearity and independence of errors.

Discussion

The current study aimed to investigate whether flow experienced during artistic activities can predict performance in art students, while also looking to examine whether teacher's feedback as perceived by students can moderate this relationship, specifically by enhancing the effects flow has on performance. Based on the results of hierarchical regression analysis, the first research hypothesis was supported (*H1*), therefore flow experienced during artistic activities is a significant predictor of performance in art students ($p < .001$). More specifically, flow explains 10% ($\Delta R^2 = .10$) of the variance in performance value, with the remainder explained by other variables that do not serve the purpose of this study. Although the result was a confirmatory one, it seems that the data collected in this study indicate a small percentage of the variance explained by the flow predictor on performance, so the results obtained should be interpreted with caution.

Several other studies have also previously shown that the flow people experience in various activities predicts performance, such as the series of research from Engeser and Rheinberg (2008), consisting of three separate studies. In two of them, they obtained similar results in the context of learning activities (of statistics and the French language), while in the other one, where flow was shown not to predict performance, the results could be easily explained by the chosen activity, namely Pac-Man game, as this is not attributed to a high functioning state that favors performance due to its intrinsic motivating nature and also, further engagement in the activity (which, depending on its frequency, can also favor performance) could not be accounted for, therefore the link was a weak one. Other similar results were obtained in domains such as sports, where we have examples such as the research of Jackson and his collaborators (2001), where performance was self-reported, as in the present study; the research of Bakker and his collaborators (2011) and Stavrou and his collaborators (2014), in the latter two performance being both self-reported (subjectively) and reported by the coach (objectively), with both obtaining significant results of a positive effect based on linear regression, thus supporting the fact that flows predicts performance.

Results of the second linear regression were also in favor of the second research hypothesis (*H2*), thus indicating that perceived feedback acts as a significant moderator in the relationship between flow and performance of art students ($p < .001$). The interaction between flow and perceived feedback makes up 5% out of the 24% of the variance explained by the predictors of performance alone, as seen in Model 1.3 (Table 4). Based on the second hypothesis, perceived feedback, as a moderator, was expected to enhance the link between flow and performance. However,

the moderator had a buffering effect on this relationship instead, meaning that the value of performance decreases if the value of perceived feedback increases (alongside the value of flow), thus the results showing partial support of *H2*.

Nonetheless, according to the scientific literature, the lack of a positive effect of feedback on performance in various activities is not as surprising as expected. For example, a literature review by Balcazar and collaborators (1985) based on 69 studies in the organizational domain, totaling 126 experiments, indicate that feedback does not have performance-enhancing effects uniformly. This could be explained by the fact that performance feedback has certain characteristics depending on which it can be more or less effective in improving performance, such as the source that provides it (e.g., supervisor), the transmission mechanism (e.g., verbal, non-verbal), the content of the message (e.g., comparison of individual performance with his past performance), its frequency (e.g., daily, weekly, monthly) and others. Balcazar and his collaborators (1985) concluded that adding behavioral consequences (reinforcement or punishment, e.g., performance-based pay, praise, time off, firing) and goal-setting procedures (e.g., discussing a desired performance outcome by the supervisor) improves the consistency of feedback effects.

The review's results indicate that the lowest level of consistency of effects (28%) and the highest proportion of combined effects (57%) were obtained in studies in which only feedback was given, without the other previously mentioned elements, these effects being defined by both increases and decreases in the level of performance statistically significant in some but not all participants in the experiments following the given feedback. However, similar to the present research, giving feedback unaccompanied by other elements was the most used procedure by researchers (37% of the total number of applications of feedback). Summarizing the results of this literature review, the highest levels of consistency in the effectiveness of feedback on performance were found when feedback was given by a supervisor individually, publicly, daily, and through written or graphic mechanisms. This literature review related to feedback was replicated by Alvero and collaborators (2001), again indicating the importance of additional factors in giving feedback and its characteristics in achieving an improvement in performance.

A meta-analysis by Kluger and DeNisi (1996) also indicated the existence of feedback interventions that decreased performance (one-third of those studied), a finding that could not be explained by either sampling errors or the type of feedback (negative or positive), nor the existing theories, so the authors proposed a theory of feedback interventions (FIT), assuming that when giving feedback, this changes the locus of attention among three general and hierarchically organized levels of control: task learning, task motivation, and meta-tasks (including self-related processes such as self-directed attention, affect, etc.), with results indicating that the effectiveness of feedback decreases as attention moves up the hierarchy, reaching close to the self and away from the task, thus altering performance in a negative way.

Furthermore, the previous observation regarding the fact that the link between flow and performance is no longer significant starting with high values of perceived feedback (greater than 37.38) can be explained by the fact that giving feedback can have detrimental effects on intrinsic motivation (Henderlong, & Lepper, 2002). According to a considerable body of research (e.g., Birch et al., 1984; Gordon, 1989; Kohn, 1993, as cited in Henderlong, & Lepper, 2002), praise (positive feedback) can create excessive pressure to perform well, may discourage risk-taking and reduce perceived autonomy. Also, ironically, research has indicated that when praise is provided for low-difficulty tasks, it can lead to inferences of low ability (Graham, 1990, as cited in Henderlong, & Lepper, 2002). Therefore, we can say that, depending on the perceived difficulty of the task in which the art students were involved, the feedback might rather have a negative effect on their intrinsic motivation, which will therefore lead to a low level of performance.

Limitations

Taking into account both the suggestions of the previously mentioned authors and our own considerations, the main identified limits of the present research will be stated as follows.

Some of the main methodological limitations of this research were represented by the limited number of participants (108), which prevented us from making inferences regarding the possible differences in experiencing the studied constructs in each artistic subfield; and the sampling procedure, carried out through the snowball method due to the limited access to the target population, namely Art degree students. This procedure poses the risk of creating a tendency towards collecting similar data from respondents following the distribution of the questionnaire, as people from the same social group, degree, class may have similar experiences. This technique makes the collection of data less objective, and therefore, this needs to be considered both when interpreting the results and also in conducting future research.

Additionally, this study included students from several art subfields, such as plastic arts, music, acting, directing, and others. Each one of them might have different characteristics based on the factors that can lead to experiencing flow (e.g., a fact shown by research in the acting – Martin, & Cutler, 2010, or musical fields – Wrigley, & Emmerson, 2011, where flow's dimensions were studied) or different standards and methods of defining performance (e.g., the quality of an artistic performance can be evaluated from the creativity point of view, as in Byrne et al., 2003, where performance was defined by the degree of involvement and the completion of tasks received in the course, according to the scale created by Williams, & Anderson, 1991), but also different behaviors through which feedback can be given, even though measuring instruments with the most suitable items that can be adjusted to an artistic setting were chosen for the variables considered.

There is a possibility that retrospective self-report measurement of the three variables studied also leads to biased estimates of student experience (Brewer et al., 1991). For example, negative affect or cognitions about the quality of their assessed performance could influence their recollection of the experience. An experimental design might be a more objective way to measure the desired variables, although this might alter the degree of ecological validity.

Another limitation is represented by the social factor, both interpersonal and intrapersonal, which this research did not emphasize much in the initial stage of establishing its design. Thus, it is important to note that some artistic fields are more favorable for practicing activities individually (e.g., plastic arts, design), while others bring students together in smaller or larger groups (e.g., acting, music). This fact requires special attention as significantly higher values of experiencing flow have been identified when activities are carried out in groups, as opposed to practicing them individually (Walker, 2010; Miell, & MacDonald, 2000; MacDonald, Miell, & Mitchell , 2002).

Continuing the previous idea regarding the significance of the intrapersonal social factor this time, it is worth noting that educational researchers have discovered the highly important role that perception has in processing feedback, thus assuming that its effectiveness depends to a large extent on the way in which students perceive and interpret it (Timmers, Walraven, & Veldkamp, 2015). Therefore, we can identify studies that indicate the fact that perceived feedback is more effective on performance if those who receive it trust its source (Earley, 1986; Huang, 2012) or if they perceive it as honest (Henderlong & Lepper, 2002). For this reason, the interpersonal and intrapersonal social factor plays a very important role in examining the variables involved in this research.

Implications and future directions

Several theoretical and practical implications arise from this study. Regarding the theoretical perspective, on the one hand, this research extended the already existing body of scientific literature focused on flow and one of its frequently studied outcomes, namely performance. On the other hand, upon investigating the literature, this relationship has been very little studied in the field of arts, an

activity with a high potential to generate flow due to its characteristics (Csikszentmihalyi, 1990; 1997; Csikszentmihalyi, & Csikszentmihalyi, 1992).

A less frequent investigated relationship in literature, however, was the moderation of perceived feedback in the link between flow and performance, thus by partially coming in support of the second hypothesis, the present findings can add to the academic literature. The buffering moderating effect of feedback on the previously stated relationship is a fact that deserves attention and further investigation in the characteristics of feedback and how it is most effectively delivered for the desired performance-enhancing effects and beyond. Based on the results of the present research we therefore understand that feedback does not have an effect of enhancing the relationship between flow and performance by giving it singularly, but, according to previous research (Alvero et al., 2001; Balcazar et al., 1985), it would be more effective in producing positive effects if given alongside certain additional elements.

In terms of practical implications, this study has particular significance for the improvement of the way teachers conduct their classroom activities, but also the way art students learn and perform tasks. Considering the limitations of the present research and some of their possible explanations stated previously (Alvero et al., 2001; Balcazar et al., 1985; Kluger, & DeNisi, 1996), it would be preferable for university teachers to include in their practice not only feedback, but also elements such as behavioral reinforcements, even rewards (not necessarily of a material nature) to avoid possible negative effects and to rather encourage its potential benefits related to performance, and maybe not only.

At the same time, this study can also help students who are looking for ways in order to improve their performance in artistic assignments. An often held belief in formal education is that students, once placed in a formal educational context to perform previously enjoyable tasks which made them experience intrinsic motivation, tend to lose these components of their experience due to the now being in a more evaluative setting, which can lead to poor engagement and completion in their tasks. Therefore, having gained support for the fact that flow can predict performance in art, moving forward we can continue to better study the preconditions necessary to experience this phenomenon according to the specific characteristics of each artistic field.

As the scientific literature is marked by a lack of research conducted in the art field, an thus in the field of artistic performance, we can only urge this to be more studied in the future, as art poses a significant role in both the actual creation and in the consumption itself as a cultural product (films, music, painting, theater) based on its many beneficial effects on health, some examples being the improvement of psychological well-being (Pizzaro, 2004) and the decrease of burnout (Italia et al., 2008).

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PUBLISHING STANDARDS

Psychology of Human Resources – guide for authors

THE EDITORS

This document represents the "Guide for Authors". It covers the format and language to be used for manuscripts submitted to Human Resources Psychology. Also, this document can be found on the webpage of the Romanian Association of Industrial and Organizational Psychology (www.apio.ro).

This "Guide for Authors" follows the 7th APA Publication Manual.

Manuscript Submission and Format

All manuscripts for the journal Human Resources Psychology should be submitted to the following e-mail address: revista@apio.ro.

To edit the manuscript please use Times New Roman 12-point type, 1.5 line spacing and the A4 page setting. Each page will be numbered in the upper right corner. The top and side margins should be left of at least one inch or 2.54 cm. A full example of a manuscript can be found in the 7th APA Publication Manual.

Publications

Accepted papers are copy-edited and retyped. Authors have to review edits and proofread their work. The editor of Human Resources Psychology will contact the corresponding author after the editor assigns your work to an issue.

If your work is accepted, please keep the editor informed of changes in your contact information and of long absences.

Front Page

The first page of the manuscript should include the following information:

1. Title

The title should be a concise statement of the main topic and should identify the variables or theoretical issues under investigation and the relationship between them. It should be typed in sentence case, centered between left and right margins, and positioned in the upper half of the page.

2. Author name(s) and institutional affiliation(s)

Author name(s) will be presented in the following form: first name, middle initial(s), and last name.

Institutional affiliation should reflect the institution/location where the author(s) were when the research was conducted. When an author has no institutional affiliation, the city and state of residence below the author´s name should be specified. The institutional affiliation should be centered under the author's name, on the next line.

3. Author´s note

This section should include the following:

- First paragraph should include the departmental affiliations at the time of the study for all authors as follows: name of the author as it appears in the byline, comma, department name, comma, university name, semicolon, next

author name, and so on, and end with a period.
- Second paragraph should include any changes in author affiliation subsequent to the time of the study as follows: [author´s name] is now at [affiliation].
- Third paragraph should include acknowledgments (only for grants or other financial support, any special agreements concerning authorship, thanks for personal assistance) and special circumstances (disclose them before the acknowledgements in this paragraph).
- Fourth paragraph should include information about the person to contact in terms of mailing address and e-mail.

Place the author note on the title page, below the title, byline, and affiliation. Center the label *Author Note.* Start each paragraph of the note with an indent, and type separate paragraphs for the authors' names and current affiliations, changes in affiliations, acknowledgments, and special circumstances, if any, along with the person to contact. The author note is not numbered or cited in the text.

Abstract Page

The abstract as well as the title of the work go on page 2. The abstract should be no longer than 150 words. The label *Abstract* should appear in sentence case, centered, at the top of the page. Type the abstract itself as a single paragraph without paragraph indentation. Place a running head (short title).

The abstract will be written in English. It is necessary to include 3-5 key words after each abstract, in all these three languages.

Main body text pages

In preparing your manuscript, begin the introduction on page 3. Type the title of the manuscript in sentence case centered at the top of the page, and then type the text. The remaining sections of the article follow each other without a break; do not start a new page when a new heading occurs.

This section should include the following:

- Introduction of the problem. This section will present the specific problem under the study and describe the research strategy. There is no need to label this section as Introduction.
- Explore importance of the problem. This section states why the problem deserves new research. State explicitly this problem according to the type of the study (empirical study, literature review and meta-analysis, methodological paper and case study).
- Describe relevant scholarship by discussing the relevant related literature and demonstrating the logical continuity between previous and present work.
- State each tested hypothesis clearly and provide a theoretical argument for how it was derived from theory or is logically connected to previous data and argumentation.

Method

This section describes in detail how the study was conducted, including conceptual and operational definitions of the variables used in the study. Authors should include the following:

- Sample description, by describing the main characteristics with particular emphasis on characteristics that may have bearing on the interpretation of results.
- Sampling procedure by describing the procedures for selecting participants in terms of sampling method, the percentage of the sample approached that participated, the number of participants who selected themselves into the sample.
- Sample size, power and precision.
- Measures and covariates by describing the methods used to collect data and to enhance the quality of the measurements.
- Research design.
- Experimental manipulations or procedures.
- Task description.

Results

This section summarizes the collected data and the analysis performed on the data to test the proposed hypotheses. Report the data analysis in sufficient detail to justify your conclusions. For more information please consult the 6th APA Publication Manual.

Discussion

This section evaluates and interprets the implications of the results, especially with respect to original hypotheses. Examine, interpret, and qualify the results and draw inferences and conclusions from them. Emphasize any theoretical or practical consequences of the results.

Also, the limits of the study and possible future studies can be considered in this section.

References

References are your entries in the *alphabetical list at the end* of your article or research note. This list should include all the works you have cited throughout the manuscript. The references should be formatted as follows:

1. Periodicals (selective examples)

Author, A.A, Author, B. B., & Author, C. C. (year). Title of article. *Title* of *Periodical, xx,* pp-pp. doi: xx.xxxxxxxxxx

Author, A. A., Author, B. B., Author, C. C., Author, D. D., Author, E. E., Author, F.F., … Author, Y.Y. (year). Title of article. *Title* of *Periodical, xx,* pp-pp. doi: xx.xxxxxxxxxx

Author, A.A, Author, B. B., & Author, C. C. (year). Title of article. *Title* of *Periodical, xx,* pp-pp.

Author, A.A., & Author, B.B. (in press). Title of article. *Title of Periodical.* Retrieved from http://cogprints.org/5780/1/ECSRAP.F07.pdf

2. Books

Author, A. A. (year). *Title of work.* Publisher.

Author, A. A. (year). *Title of work.* Retrieved from http://www.xxxxxxx

Author, A. A. (year). *Title of work.* doi: xxxxx

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3. For chapters in a book or entry in a reference book (selective example)

Author, A.A., & Author, B.B. (year). Title of chapter or entry. In A. Editor, B. Editor, & C. Editor (Eds.), *Title of book* (pp. xxx-xxx). Publisher.

Author, A.A, &Author, B.B. (year). Title of chapter or entry. In A. Editor & B. Editor (Eds.), *Title of book* (pp. xxx-xxx). Retrieved from http://www.xxxxxxx

Author, A.A., & Author, B.B. (year). Title of chapter or entry. In A. Editor, B. Editor, & C. Editor (Eds.), *Title of book* (pp. xxx-xxx). Publisher. doi: xxxxxxxx

4. Meeting and symposia (selective examples)

Contributor, A.A., Contributor, B.B., Contributor, C.C., & Contributor, D.D. (Year, Month). Title of contribution. In E.E. Chairperson (Chair), *Title of symposium.* Symposium conducted at the meeting of Organization Name, Location.

Presenter, A.A. (Year, Month). *Title of paper or poster.* Paper or poster session presented at the meeting of Organization Name, Location.

5. Unpublished works (selective examples)

Author, A.A. (Year). Title of manuscript. Unpublished manuscript [or "Manuscript submitted for publication," or "Manuscript in preparation"].

For a detailed description of the procedure related to the citation of other types of work than those listed above, consult the 6th APA Publication Manual.

Footnotes

Footnotes are used to provide additional content or to acknowledge copyright permission status.

Appendices

The appendices of the manuscript (labeled APPENDIX A, APPENDIX B etc.) contain materials that supplements article content such as lengthy methodological procedures, calculations of measures, scales etc.

Tables and Figures

The author should number all tables and figures with Arabic numerals in the order in which they are first mentioned in the text, regardless of whether a more detailed discussion of the table or figure occurs later in the paper. The author should label them as Table 1, Table 2, and so on or Figure 1, Figure 2, and so on. List all tables first followed by figures. Place tables and figures after appendices at the end of the manuscript, and indicate the position of each in the text as follows:

Insert Table 1 about here

Each table or figure needs an introductory sentence in your text. The format agreed is the standard (canonical) one. Each table should report one type of analysis (which is identified in the title), and each vertical column and horizontal row should contain only one type of data.

Citation

It is important to put in the Reference section every work you have cited throughout the manuscript. The author can cite in-text as follows:

1. One author

Name and year: It has been found that X is associated with Y (Author, year)

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2. Two authors

When a work has two authors, the author should cite both names every time the reference occurs in the text.

When a work has three, four, or five authors, you should list only the first author's name followed by "et al." (et al., year) in every citation, even the first, unless doing so would create ambiguity between different sources.

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The author should order citations *alphabetically.* Designate two or more works by one author (or by an identical group of authors) published in the same year by adding "a," "b," and so forth, after the year.

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When a work has no identified author, the author should cite in text the first few words of the reference list entry (usually the title) and the year. Use double quotation marks around the title of an article, a chapter, or a web page and italicize the title of a periodical, a book, a brochure, or a report:

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(Johnny, 2011, p. 13)

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When the original work is out of print, unavailable through usual sources, the author should give the secondary source in the reference list and in the text you should name the original work and give a citation for the secondary source

Minnie's report (as cited in Smith, 2011).

Thank you for paying attention to the conventions outlined in this guide – it will help the work of everyone involved in the publication of this journal.